## *Soybeans*

You can eat soybeans green in the pods, shell them or dry them. They are very high in protein. The beans can be crushed for their oil and the flour which is left can be added to the flour of cereals to make a high protein bread.

### Soil and climate

Soybeans grow well only where it is warm. They don't mind slightly acid soils, like high organic matter, and will grow in quite moist conditions.

### Soil treatment

Soil with plenty of humus in it just needs a light forking. Otherwise dig thoroughly and lime for a pH of 6.5.

### Propagation

Sow them outdoors in early summer; a good rule is to sow when the apple trees are in full bloom. Sow an inch (2.5 cm) deep and three inches (8 cm) apart in the rows – deep bed method (see p. 106) four inches (10 cm) apart. Where the beans have not been grown before, the seed should be inoculated with nitrogen-fixing bacteria, because it is likely that the right bacteria do not exist in the soil.

**INOCULATING SOYBEAN SEED**
*Where soybeans have not been grown before, the soil may not contain the right nitrogen-fixing bacteria. Prepare seeds by stirring them up with water in a bowl. Add nitrogen-fixing bacteria to the water-coated seeds, making sure each seed is thoroughly covered with the bacteria. Careful inoculation will increase your yield by up to a third – and improve your soil into the bargain.*

### Care while growing

Hand weed rigorously, and mulch with compost if you can.

### Pests and diseases

Soybeans are very hardy but they can suffer from various fungus diseases (see Pole beans). These can be prevented by proper crop rotation.

### Harvesting and storing

Pick soybeans green and eat them whole, or wait for them to ripen, in which case steam or boil the pods for a few minutes before shelling them. Otherwise pull the plants and hang them up to dry.

## *Peanuts*

Peanuts, or ground nuts or monkey nuts, are very rich in the vitamins A, B and E. They grow extensively in the southern states but can only be grown in the colder northern states with glass protection at each end of their season. As they are quite cheap to buy and as there are so many other things we really need our glass for they are hardly worth growing in cool climates.

### Soil and climate

Peanuts need a warm growing season of over four months; five is ideal. They like sandy soil and, unlike most legumes, they like an acid soil: pH of 5 is about right.

### Soil treatment

Dig deeply and incorporate plenty of compost. Never lime for peanuts.

### Propagation

You can plant peanuts, shells and all, or shell them and plant the nuts. Plant shells eight inches (20 cm) apart, nuts four inches (10 cm) apart. For the deep bed method (see p. 106) allow four inches (10 cm) and three inches (8 cm) respectively. In warm climates plant four inches (10 cm) deep, but in cool climates make it only one and a half inches (4 cm). To give them the longest possible growing season in cool climates they should be planted at about the time of the last probable frost. You may need to start them off under glass, if you live in a very cold place. Sow them in rows 30 inches (75 cm) apart.

### Care while growing

The yellow flowers are the staminate ones; the productive pistillate flowers are inconspicuous, and after being fertilized they bury themselves in the ground and develop into peanuts. Raise the soil in a circle around the plant so that the fruits forming at the ends of their stems can easily bury themselves. Peanuts will only ripen below ground.

### Pests and diseases

Peanuts are hardy and rarely suffer from pests or diseases.

### Harvesting and storing

In a warm climate pull the vines when the leaves go yellow and hang them in a dry airy place. In more temperate climates leave them until after the first frosts – the nuts will continue to ripen underground even after the leaves have frosted away. Before eating them roast your peanuts in their shells for 20 minutes in a 300°F (150°C) oven and leave them to cool – a vital part of the peanut roasting process.

# *Cruciferae*

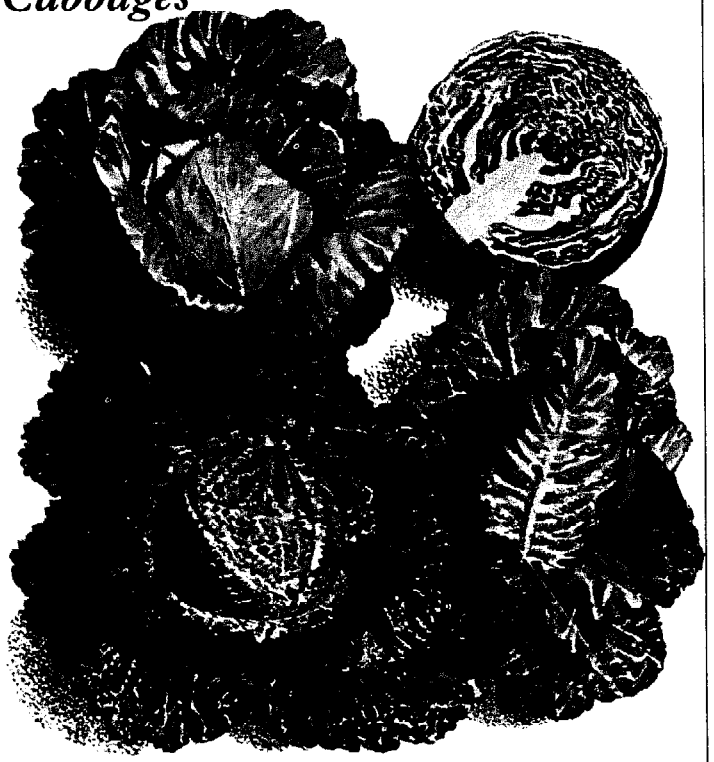
*Cabbages, Brussels sprouts, cauliflowers, broccoli, kale, kohl-rabi, rutabagas, turnips, seakale, cresses and radishes* all belong to the *Cruciferae*, which is one of the most important families, for it includes the genus *brassica*, the cabbage tribe. This contains a great variety of plants which have been bred by mankind to a profusion of different forms most of which are very good to eat. The reason for the peculiar succulence of the *brassica* is that nearly all the cultivated members of it are descended from the sea cabbage, and this gives them certain important characteristics. One is that they share with desert plants the ability to make do on very little fresh water, and another is that they are adapted to store what water they can get. It is this last fact that makes them so succulent. They guard the water they get under a waxy, waterproof cuticle.

Another characteristic of the *brassica* is that they are biennials: that means they store food in themselves during their first year of life and then flower and go to seed in their second. The stored food and energy of the first year's growth is available to us and our animals all winter.

### Seed-bed for brassica

There are spring cabbages, summer cabbages and summer cauliflowers, but you can take it that most of your *brassica* will be for winter use. So you will find yourself, around early spring in temperate areas, establishing a seed-bed (see p. 92). This might be an area – depending on the size of your garden – as big as a table top. Work it to a very fine tilth, score parallel lines six inches (15 cm) apart with the corner of the hoe, lightly sprinkle seed along the rows, then cover the seeds with fine compost or earth, firming with the side of the rake. Plant a row each of cabbage, red cabbage, Brussels sprouts, fall cauliflower, sprouting broccoli (including calabrese) and, for good measure, leeks. I know the latter are not cruciferous but they go in there just the same. You must keep this seed-bed well watered, and when the plants are about five inches (13 cm) high, plant them out in their permanent beds, or if you are trying to get two crops, their holding-beds. In cold climates you must sow these seeds in seed boxes (flats) indoors, and plant them out later.

## *Cabbages*



### COMMON CABBAGES

You can grow cabbages all the year round in temperate climates and in climates with freezing winters you can easily store them the winter through in a shed or cellar. They are delicious raw and, if organically grown and cooked for a very short time, they are equally good served hot. They come with round or conical hearts, but this makes no difference to the way you grow them. Winter main crop cabbages are very high yielding: it is not unusual to get, on a field scale, forty tons per acre (100 tonnes per hectare). On a garden scale you can reckon on getting from a pound to a pound and a half (500–700 g) of cabbages per foot (30 cm) of row. So they are a good crop to grow, even if you only have a small garden.

#### Soil and climate

Cabbages will grow almost anywhere, but in hot dry areas they can only be grown in the fall and winter. They will stand winter frosts down to 20°F (−7°C): below that it is better to store them. They are greedy plants and like good soil, with plenty of organic matter in it and plenty of nitrogen and lime.

#### Soil treatment

Unlike the other *brassica*, cabbages like deeply dug ground with plenty of humus worked into it. If they follow the *Leguminosae* (pea and bean family) they will not need lime. If they don't they may well fare better if you do add a generous helping of lime.

#### Propagation

If you want cabbages all the year round, you have to divide them in three groups: winter, early and mid-season.

***Early cabbage*** Early varieties may form their small heads in under 70 days from seed and require only a square foot each in which to develop. For a spring to summer harvest sow the seeds in greenhouse or hot-bed or cold frame about six to ten weeks before the last expected killing frost. As they prefer cool moist conditions plant outdoors as soon as danger of hard frost has passed.

***Midseason (summer) cabbage*** These will probably form

the greater bulk of your cabbage plantings. They can be planted in greenhouse or hot-bed or cold frame at the same time as the early crop, but they take longer to mature. Although they stand the hot weather better than the early types, they should still be given an early start so they can really get growing before the heat hits them. You can grow them quite easily as long as your summers are not too hot and dry. Plant out when they are tiny, about two inches (5 cm) high, in very good soil and keep them well-watered. Plant them in staggered rows 18 inches (45 cm) apart with 18 inches (45 cm) between rows. If you use a deep bed (see p. 106) allow 15 inches (38 cm) between plants.

***Late fall or winter cabbage*** Late cabbages are usually started in early summer and harvested in late fall. They are less susceptible to heat than the earlier kinds and make their heads during the fall weather.

You can double-crop – that is take two crops of different vegetables from the same bed in quick succession. To do this you must plant them out firmly in a holding-bed (see p. 93), a piece of the garden set aside for them, with each plant about six inches (15 cm) from its neighbors. Then, when ground becomes available as you harvest your early potatoes or peas and beans during the summer, you can plant out your cabbages and any other *brassica* which are in the holding-bed. They don't seem to suffer from this double transplanting.

### Planting out

Plant out cabbages and all *brassica* firmly. Make a hole with a dibber, put the plant in at the same depth as it was in the holding-bed, and firm the soil around it with either the dibber, your hand or your shoe. Dipping *brassica* roots in a bucket of thin mud with a handful of lime in it before planting out helps them a lot. This brings the roots into instant contact with the awaiting earth. I knew an old gardener who dipped his plants in a paste of half earth and half cow dung with a handful of soot in it; he grew magnificent cabbages.

### Care while growing

Cabbages must suffer no set backs. They must have plenty of water and nitrogen and no weed competition. If you are going to the extravagance of using some organic high-in-nitrogen manure like blood meal, bone meal, cotton seed meal, chicken or rabbit manure, then the *brassica* crops are good ones to put it on. Use it as a top dressing when they begin to grow. If the plants are checked, say by cabbage root fly, help them on with a dressing of this kind. You may save them. Don't put nitrogen on just before the winter; it drives them on too fast, makes them sappy and susceptible to frost damage. Hill up the stems as the plants grow.

### Pests and diseases

If you are a good organic gardener and lucky, you may avoid these pests and diseases.

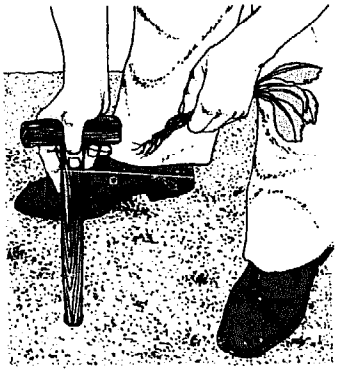
***Clubroot*** One of the most troublesome things in the garden, but many people live all their lives and never see it. Your garden either has it or it hasn't. Beware, though, if it hasn't got it, because it can get it: by your buying infected plants; your bringing in manure from a contaminated source; you can even bring it in on your shoes, after visiting a neighbor's garden which has it. Don't put the stems of bought cabbages on your compost heap unless you have inspected them first and made absolutely sure they have not got clubroot.

When you have got clubroot you will find lumps or malformations on the roots of your wilting cabbages. You can get this with all the *brassica*. Cut a few of your root swellings open. If there is a maggot inside one, what you have probably got is cabbage gall weevil, not clubroot. Rejoice. At least that is preventable. But you can, of course, be favored by both.

Clubroot is caused by microscopic spores of a fungus which can lie dormant in the soil for up to seven years. The disease can be eradicated if the land is rested completely from cruciferous plants for seven years, and that means no cruciferous weeds either – so no shepherd's purse or charlock. The disease thrives in acid soil so lime helps to reduce it. If you can get the pH up to 7 you may get rid of it. But many gardeners have to live with clubroot (I have done so for several decades) and just grow *brassica* crops in spite of it. Non-organic gardeners dip the roots of their plants in calomine at the planting out stage. Calomine is a highly poisonous mercuric compound. The mercury is persistent in the soil and over the years inevitably builds up to serious proportions. Furthermore, the treatment is only occasionally effective. I fear that the plants are often infected invisibly at the seed-bed stage in which case nothing will cure them.

Preventive measures are: strict rotation so that cruciferous plants don't recur more often than once in four years; liming; burning of all affected roots; putting half a moth ball (camphor) down each hole before planting; putting a half inch (1 cm) length of rhubarb stem down each hole before planting; putting an equal mixture of wood ashes and crushed eggshells, down each hole. I have not had complete success with any of these, but they may help depending on your particular circumstances.

A new line of attack, which is being researched by the Henry Doubleday Association in Essex, England, is to douse the land that is not being planted with *brassica* with water in which *brassica* plants have been boiled. The effect of this is to wake the sleeping spores by fooling them into thinking that *brassica* have been planted. But there are no *brassica* and



**DIPPING, DIBBING AND FIRMING**
*Prepare cabbages for planting by dipping the roots in a bucket of thin mud mixed with a handful of lime. Remember cabbages should be planted firmly. Use a dibber to make a hole to the same depth as the plant was growing in the holding-bed. Then pack the soil around the plant and heel in firmly with your shoe.*

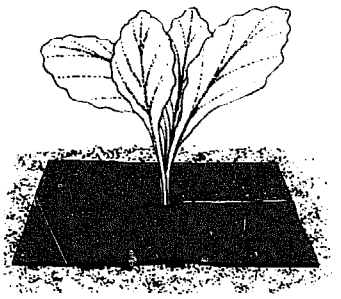
the awakened spores, being unable to go dormant again, die.

Yet another approach, which is worth trying, is to sprinkle affected ground with 65lbs (30kg) of quicklime per 100 square yards (84 sq m) and then leave the ground *brassica*-free for at least five years.

***Cabbage root fly*** This attacks cabbages and cauliflowers but is less likely to go for Brussels sprouts or broccoli. If your plants wilt and you pull them out and cut into the roots and stems and find maggots, those are cabbage root fly maggots. When plants are badly affected their leaves appear bluish, with yellow edges. The fly, which looks like a house fly, lays its eggs on the top of the ground near the plants. The larvae hatch out, dig down through the soil, and then burrow up into the stem. Once there, nothing will shift them completely and they can kill the plant. Poisons don't help because they kill predators but on the whole tend to miss the maggots.

Small squares of tarpaper put like collars around each plant can obstruct the maggots. Either slit a five inch (13 cm) square piece of tarred paper from one side to the middle and slip each plant into the slit, or else fold the paper in half, snip a "V" out of the middle and thread the plant through the resulting hole. The flies lay their eggs on the paper and the maggots can't get down into the earth. A smear of kerosene on the paper is a good idea.

If plants do become infected, I hate to say it but a teaspoonful of nitrate of soda, or some other high inorganic nitrogen substance works wonders. It not only helps the plant to start growing quickly and make new roots, but it also seems to disperse the maggots. Banking the soil up around the stems of affected plants also seems to help them; the plants can put out new and healthier roots. Kerosene just sprinkled on the ground around each plant, once a week until they are large and healthy, also acts as a deterrent.



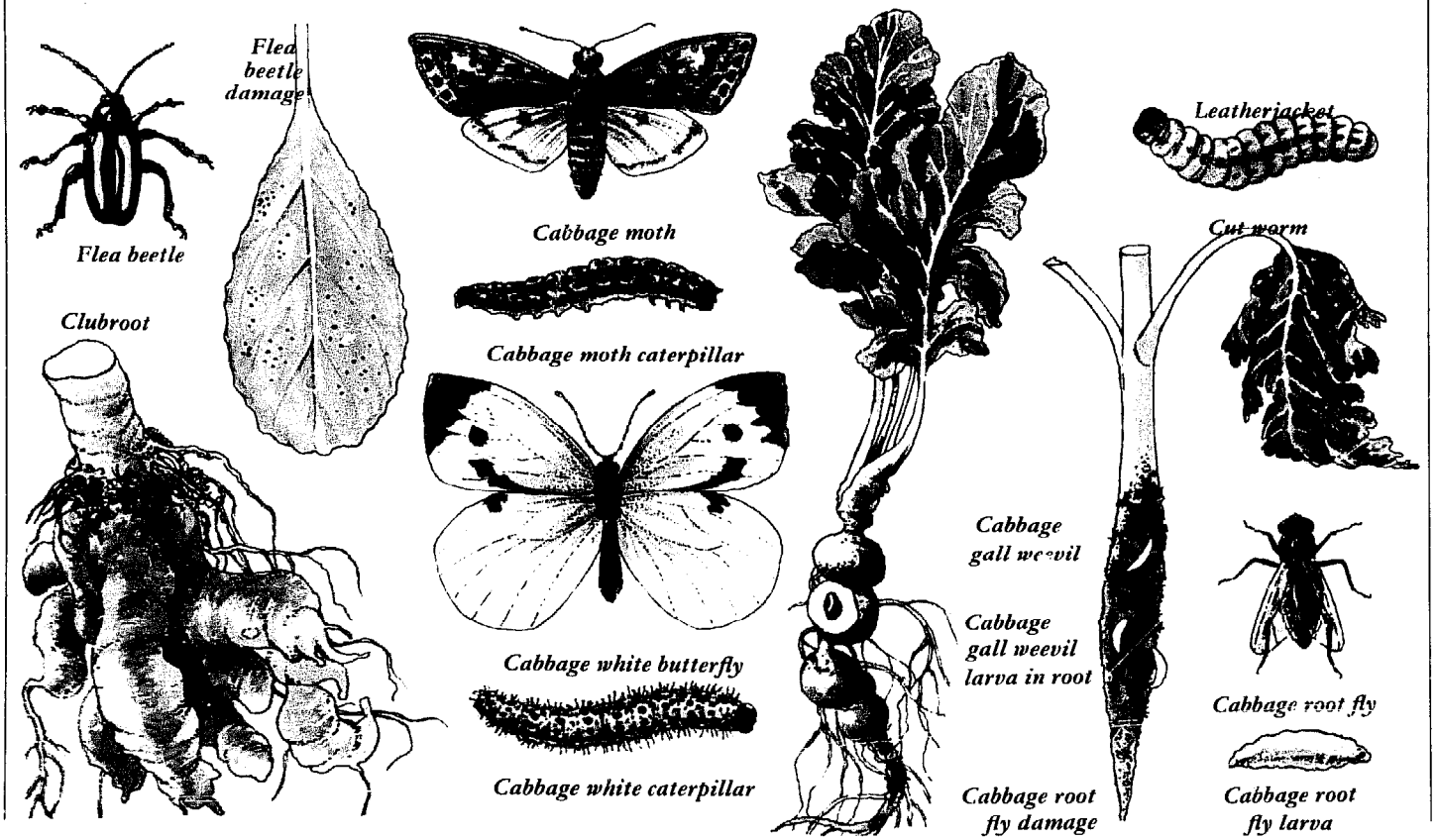
**A TARRED COLLAR**
*Slit a five inch (13 cm) square of tarred paper from one side to the middle and slip it around the plant. A smear of kerosene or grease on the paper is also a good idea. The cabbage root fly will lay its eggs on the paper, but the maggots will not be able to get down into the earth to burrow up inside the plant stem.*

**A SEED PACKET COLLAR**
*An old seed packet, torn at both ends and placed over your cabbage plant, is effective protection against the destructive cut worm. Alternatively surround each plant with a ring of wood ash.*

Burn all infected roots after the plants are lifted and fork the soil over frequently in winter to allow the birds to help themselves to the pupae which are lying dormant in the soil.

***Cabbage gall weevil*** These sometimes attack plants in the seed-bed, and you will see small galls on the roots when you come to transplant. If there's only one gall, cut it open and kill the maggot. If there are more, burn the plant.

***Cut worm*** These minute worms frequently nip small plants off at ground level. Keep them away with a ring of wood ash or by placing a cardboard collar around each plant. A simple collar can be made by tearing both ends from an old seed packet.



***Cabbage white butterfly*** The caterpillars of these can completely ruin a stand of cabbages if allowed to go unchecked. The best way to get rid of them on a small scale is to pick them off. Other remedies are to soak with soapy water, or sprinkle with a mixture of soot and lime.

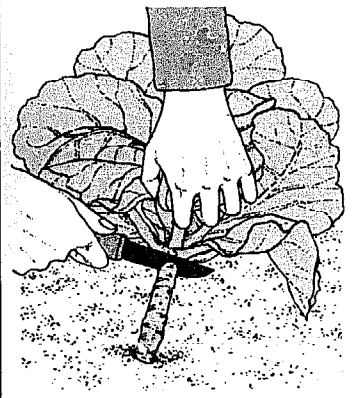
***Cabbage moth*** Pyrethrum or derris spraying will kill these larvae which eat the hearts of cabbages and whose droppings can cause mold.

***Leatherjackets*** These are the gray-brown legless larvae of the crane fly. They sometimes eat the roots of *brassica* seedlings in late spring, causing the plants to wilt and die. All you can do is dig the ground very thoroughly and frequently in early spring so that the birds can eat the larvae.

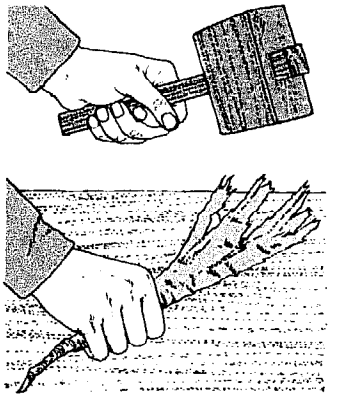
### Harvesting and storing

When you have cut a cabbage pull the root out immediately; if you leave it in, it will encourage disease. If the plants are healthy, you can hammer the stems with a heavy mallet or sledge hammer, or else run the garden roller over them. The object is to crush them, so that they can be put on the compost heap or buried in a trench over which you will plant next year's pole beans.

Cabbages can be stored by putting them on straw in a frostproof shed or cellar and covering them with more straw. In temperate climates just leave them growing until you want them: 20°F (—7°C) won't hurt them.



**HARVESTING CABBAGES**
*Cut your cabbages at the top of the stem with a sharp knife. Remember to pull the stem and root from the ground.*



**HAMMERING CABBAGE STEMS**
*Hammer the uprooted cabbage stems with a mallet. The crushed stems can be left to rot for compost or buried in a trench.*

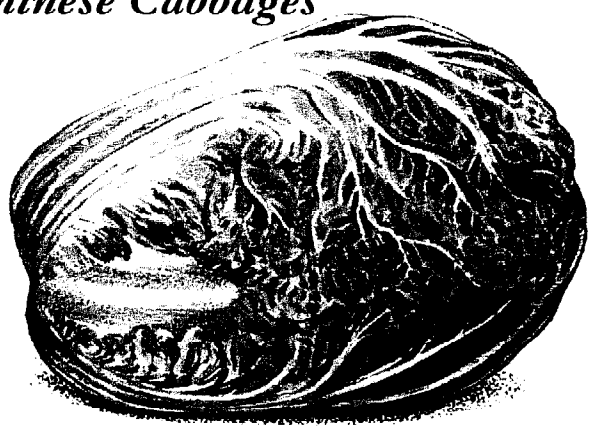
## SAVOYS

These are the hardiest cabbages, and for late winter and early spring use the most valuable. Treat them like winter cabbages, but don't eat them until the winter is well advanced and most other vegetables have gone. They fill a gap in the early spring.

## RED CABBAGES

Start seed of fast-maturing varieties indoors in late winter for a spring crop. Sow slower maturing varieties outdoors in a seed bed and plant out in permanent positions in the summer. Make sure the soil is firm, otherwise the cabbages will not develop large and compact heads. Remember that although you can eat red cabbages raw, if you cook them they need far longer than ordinary cabbages – up to two hours.

# *Chinese Cabbages*



There are different varieties of Chinese cabbage – the Wong Bok produce rounded heads, the Michihli forms a tall cylindrical head and the Pac-Choy are loose-leaved.

### Soil and climate

Chinese cabbage is not so winter-hardy as cabbage, but nevertheless it does not do well in heat. It does not like acid soil.

### Soil treatment

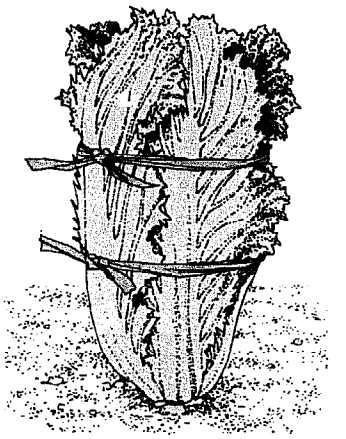
They like plenty of humus. A four inch (10 cm) covering of compost on the soil forked in before planting is ideal.

### Propagation

Sow the seed *in situ* in late summer or even later if you have no winter frost. Either broadcast and single out later or sow thinly in rows.

### Care while growing

Chinese cabbages need plenty of water. Mulching when the plants have grown to six inches (15 cm) helps to conserve moisture. Tying with raffia at top and bottom also helps to conserve water. Thin to about nine inches (25 cm) apart. If the plants grow big and crowded, uproot half and eat them. They suffer very little from pests or diseases; what they do have will be something that afflicts cabbages (see Cabbages).



**TYING A CHINESE CABBAGE**
*You must never allow a Chinese cabbage to go without water. When it has grown to about six inches (15 cm), a good mulching will help to conserve moisture. But as soon as the heart begins to form, it is an excellent idea to tie the leaves together top and bottom with strips of raffia. This will keep the plant sufficiently moist and at the same time blanch the inner leaves. Later on thin the plants to about nine inches (25 cm) apart; if they still grow crowded, uproot half and eat them.*

### Harvesting

Uproot them and eat them, either in salads or as cooked greens, as soon as they have a good heart. This can be as soon as ten weeks after planting.

# *Brussels Sprouts*

Don't be put off Brussels sprouts by the store-bought ones. They have usually been picked at top-size and have a strong flavor. Home grown sprouts, picked small, are quite different.

### Soil and climate

Sprouts grown in regions which have no frost are tasteless, but where there is frost they make a noble standby for late winter and spring. Sprouts grow well in any good soil.

### Soil treatment

Deep cultivation and plenty of manure or compost are the rule. They need lime if the soil is acid. The traditional way to grow them is in very firm soil. Deep bed gardeners can transplant them into soft deep beds (see p. 106) by planting them deeper than usual and pressing down the soil around them with one hand before and during planting.

### Propagation

Traditionally seeds are sown in an outdoor seed-bed in early spring. But you can get better results by sowing indoors in seed boxes (flats) from midwinter onward. Prick them out into frames if you sowed them early, then when they are about five inches (13 cm) tall plant them in a holding-bed (see p. 93) and then again into their permanent quarters where they should be three feet (90 cm) apart in rows three feet (90 cm) apart. Like other *brassica* they seem to benefit from transplanting. Deep bed gardeners should allow 20 inches (50 cm) between plants.

### Care while growing

Brussels sprouts gain a lot from being earthed up while they are growing, and mulching is also good for them. Like all other *brassica* they don't like weed competition. Brussels sprouts grow very tall, so in very windy positions in exposed gardens, it may be necessary to stake them, but in most places a good earthing up will provide sufficient support. It is important to strip the lower leaves off when they begin to turn yellow.

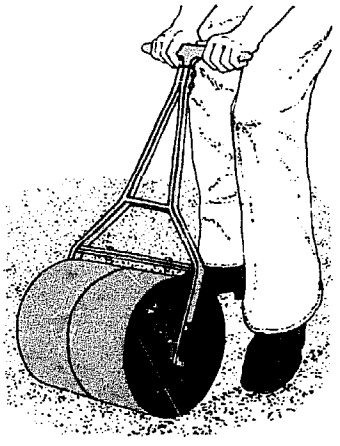
### Pests and diseases

Brussels sprouts are prone to all the diseases that afflict cabbages (see Cabbages).

### Harvesting and storing

Seed sown in midwinter, indoors, will give sprouts as early as September, but these will not have the flavor of the later ones which have the benefit of a touch of frost. Like all vegetables, other than roots, they can be picked just as soon as they are ready. Pick the bottom ones first, then pick upward along the stems as more ripen, and finally eat the tops of the plants. If you have chickens, hang the denuded plants upside down in the chicken run. You can go on eating fresh sprouts in temperate climates right into the spring. If you grow sprouts, your garden in late winter may well be just a bare and untidy mud patch, with a sprinkling of snow on it and a few dozen tattered Brussels sprouts, naked as to their lower parts, bravely leaning against the freezing wind, sleet or hail.

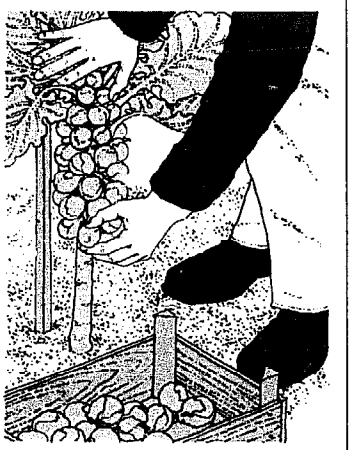
In regions of intense cold or deep snow you can harvest the sprouts by pulling the plants out of the ground before the worst weather comes, and store them by heeling them into the earth or sand in a cellar or store room. If it is cold enough they will keep for months like this.



**ROLLING THE BED**
*Sprouts need firm soil or they'll grow loose-leaved. Prepare the bed for planting by stamping on it or rolling with a heavy garden roller.*

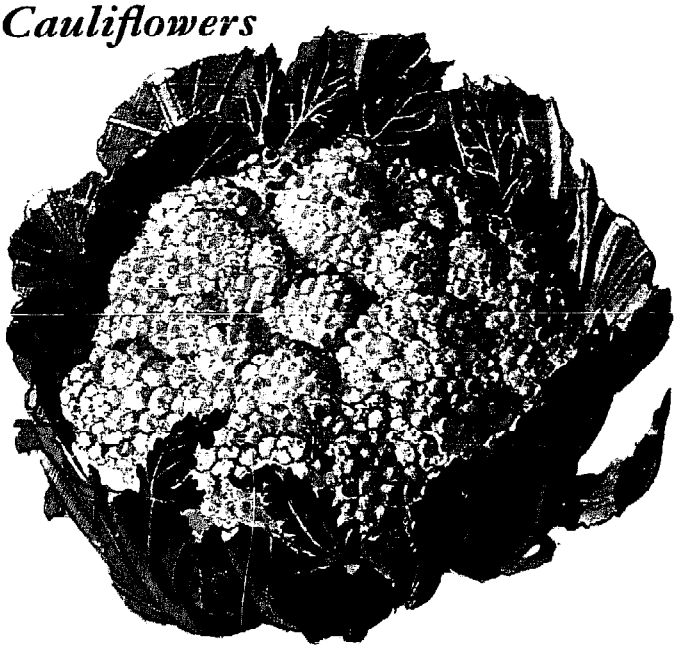
**EARTHING UP**
*Deep cultivation is essential for sprouts. At regular intervals earth up around the base of each plant with a hoe.*

**STAKE SUPPORTS**
*Sprouts can grow very tall, so it's a good idea to stake the stem of each plant – especially if it is growing in a windy position.*



**PICKING SPROUTS**
*When the sprouts have grown to the right size, pick first from the bottom of the stem, then work upward to the top of the plant.*

# *Cauliflowers*



## EARLY AND MAIN CROP CAULIFLOWERS

To develop cauliflowers, and also broccoli, man has taken the basic biennial cabbage plant, which naturally flowers in its second year of growth, and bred it to flower in its first. Cauliflowers have heads made up of tightly bunched white or purple flowers; the purple ones, sometimes called purple hearting broccoli, turn green when cooked. When you grow cauliflowers remember that you are asking biennial plants to get through the whole of their life-cycle – growth, storage of nourishment, and flowering – all in one short season.

### Soil and climate

Cauliflowers do best in temperate climates. They prefer heavy, moist soil with plenty of humus. They simply won't grow on poor soil, or in bad conditions.

### Soil treatment

They need very firm soil, so don't pull out the pea or bean plants which may precede the cauliflowers in the bed, because this will loosen the soil. Hoe them off instead, leaving the roots in the ground. Then roll or tramp. Like all *brassica*, cauliflowers don't like acid, so you must lime as necessary. Fork on a good dressing of fish manure (see p. 90) two weeks before planting. They also need some potash.

**PLANTING OUT CAULIFLOWERS**
*Young cauliflower plants can be removed from the seed box as soon as they have grown three true leaves in addition to the original two seed leaves. But check that the plant isn't "blind" – meaning that it has failed to develop a bud in the center. If it is blind, then it won't be of any use to you – without the bud, your cauli just won't flower.*

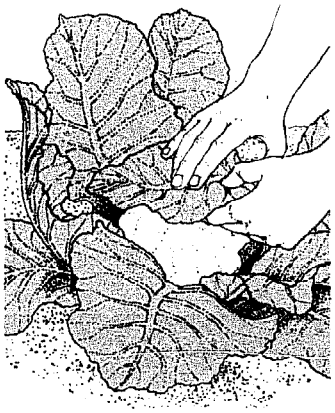
### Propagation

You can get very early cauliflowers by sowing seed in mid-winter indoors and planting out as soon as the ground has warmed up after the winter – probably in the middle of spring. With luck you will be eating them by midsummer.

For your main crop sow seed in your brassica seed-bed (see p. 122) after the last frost. Sow a quick-maturing variety so that you can begin to harvest in late summer, alongside a slower variety which can be harvested in the fall and early winter. Plant out as soon as the plants have three true leaves as well as the two original seed leaves. If you are double-cropping, plant out in your holding-bed (see p. 93) and move them to their final position after peas or beans in mid-summer. Examine the plants when you take them out of the seed-bed. If they are "blind", meaning they have no tiny bud in the middle, throw them away. They won't make curds as the flowers are called. For the final planting out allow two feet (60 cm) between rows with 20 inches (50 cm) between plants. Allow 15 inches (40 cm) between plants if you use the deep bed method (see p. 106).

### Care while growing

Do plenty of hoeing. Top-dress the growing plants with high nitrogen if you have it, but if your ground is really organic, with plenty of humus in it, a mulch of compost will do very well. Don't let your cauliflowers dry out because they must keep moving.



**BLANCHING THE CURDS**
*Sunlight striking cauliflower curds can cause not only discoloration, but sometimes even a bad taste, so you need to protect them from the sun. Cover them by bending or breaking some of the outer leaves of the plant, and tying these in position over the plant with string.*

If you don't want the trouble of blanching your cauliflowers, try growing purple ones. They last longer in the ground than the white headed variety and need no blanching. The heads are deep purple on top and turn green when cooked; the flavor is like a mild broccoli.

### Pests and diseases

Cauliflowers share their pests and diseases with cabbages.

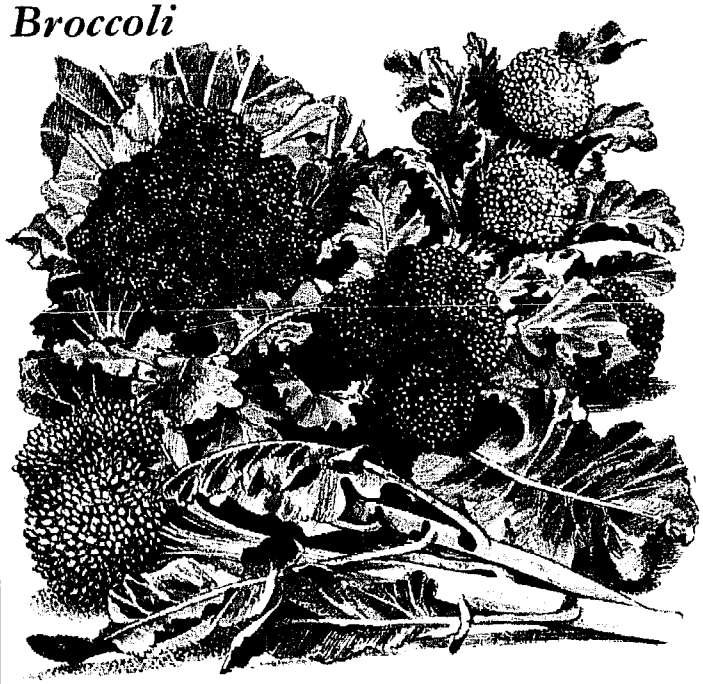
### Harvesting

Harvest your cauliflowers as soon as they develop solid curds. The first should appear in late summer. If you wait the curds will loosen and deteriorate. Cut well below the head if you want to eat the cauliflower immediately. If you pull them up by the roots you can store them in a cold cellar for up to a month.

## WINTER CAULIFLOWERS

Winter cauliflower is also known as self-protecting broccoli, but it looks and behaves like cauliflower, except that it is hardy in mild climates and comes to harvest from midwinter. Sow in late spring and treat like main crop cauliflower.

## *Broccoli*



The broccoli most commonly grown in the U.S. forms a green head, and is known as calabrese in other countries. It is very easy to grow and has more flavor than other varieties, but the plants are less hardy. The purple and white sprouting varieties are winter-hardy and can be harvested from late winter on.

### Soil and climate

Good soil is not essential and they will grow in any but the very coldest climates.

### Soil treatment

Give them very firm ground; even grassland from which you have just stripped the turf will do. Sprinkle with lime if your soil is at all acid.

### Propagation

For an early crop sow broccoli indoors in eary spring and plant it out after last frost. For a slightly later crop sow seed outdoors just before last frost. White and purple varieties are sown in the brassica seed bed in spring and planted out when there is room for them. Allow 18 inches (45 cm) between plants and 30 inches (75 cm) between rows. For the deep bed method (see p. 106) allow 18 inches (45 cm) all ways.

### Care while growing

Mulch between the rows in summer. Mulch with straw in winter and stake the plants if they grow tall.

### Pests and diseases

Broccoli gets clubroot mildly. It does not suffer badly from pests.

### Harvesting

Pick, and pick again, from the little flowering shoots as these become available. Keep picking right through summer. White and purple varieties can be picked through fall and even winter.

## *Kale*

Kale is very winter-hardy and is often the last of the winter *brassica* left standing. It will withstand temperatures below freezing and may be used nearly all winter as far north as Philadelphia. There are many varieties, both crinkly and smooth leaved, including collards. Kale is a non-hearting cabbage plant. All you get is the green leaves and these are much better after a frost. Although they don't have the same delicacy of flavor as other brassica, they are very nutritious and rich in vitamins. Cooked kale, provided it is only lightly cooked, has twice as much vitamin C as the equivalent weight of orange juice.

### Soil and climate

Grow it wherever there are frosts. Any soil will do, but it crops best on rich soil.

### Soil treatment

Kale likes fertile soil which need not be especially firm.

### Propagation

Grow kale for eating in your *brassica* seed-bed (see p. 122) and plant it out, when you have room, 20 inches (50 cm) apart in rows 30 inches (75 cm) apart. If you use the deep bed method (see p. 106) allow 15 inches (40 cm) between plants in all directions.

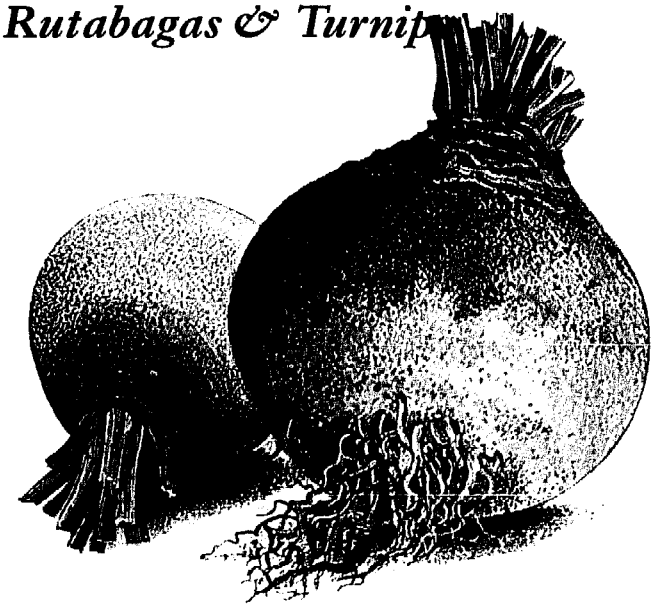
### Pests and diseases

Kale has a strong built-in resistance to clubroot. You can protect it from cabbage root fly and cabbage white butterfly by spraying with nicotine in the autumn. Kale is very tough but all the same it can suffer from any of the cabbage pests and diseases (see Cabbages).

### Harvesting

Harvest from midwinter onward. Pick leaves and side shoots, but always leave some on the plant. Your crop will last you till late spring if you are very lucky. Young leaves can be eaten in salads; other ones are good boiling greens.

# Rutabagas & Turnips



Rutabagas and turnips are both *brassica* in which the first year's nourishment is stored in the root instead of, like the other *brassica*, in the stem or the leaves. Rutabagas are orange whereas turnips are white, and rutabagas have their leaves coming out of a neck on top of the root whereas turnip leaves grow directly from the root. Turnips will not stand severe frost, but rutabagas are a lot more hardy.

Turnips will come to harvest between 60 and 80 days after sowing. Rutabagas take about a month longer. Both can be sown late in the summer. They therefore make a good "catch crop"– a crop put in late after you have cleared the ground of something else. This is another way of getting two crops from the same plot in one year. When you are choosing what variety of turnip to plant, don't overlook the fact that some varieties can do double duty by producing both edible leaves and roots. In some varieties the foliage can be used for greens a month after seeding.

## Soil and climate

They do best in a cool and damp climate. In hot weather they become hard and fibrous and are likely to go to seed. If you live in a hot climate you must sow either very early in the spring so that they can be harvested when very young and tender, before the hot weather of the summer, or late in the fall when they will grow happily into the winter and come to full maturity. A light fertile loam is ideal, but they will grow in most soils. They like a neutral or slightly alkaline soil like all *brassica*, so lime if your soil is acid.

## Soil treatment

Cultivate deeply. Like all root crops, turnips and rutabagas like a very fine tilth. If you get a lot of rain in your area, grow your turnips and rutabagas on ridges. You can encourage their capacity for fast growing by manuring a year in advance.

## Propagation

In cool temperate climates turnips for picking and eating young should be sown in late spring and then, if you are a turnip lover, twice more at monthly intervals. Sow main crop turnips for storing in late summer. Even early fall is not too late to get a good crop of "turnip tops", which are even tastier than spinach and contain lots of iron. Sow rutabagas in early summer. The same sowing will provide young sweet rutabagas for eating in late summer and main crop for storage. Sow both turnips and rutabagas thinly in shallow drills where they are to grow. An ounce (28 g) of turnip or rutabaga seed will sow 250 feet (75 m) of row.

**THINNING THE SEEDLINGS**
*Turnips or rutabagas shouldn't be crowded together. Start thinning them out, using a hoe, when they are still quite small. Leave about nine inches (23 cm) between plants. If you're using the deep bed method, a distance of about six inches (15 cm) between plants will be enough.*

## Care while growing

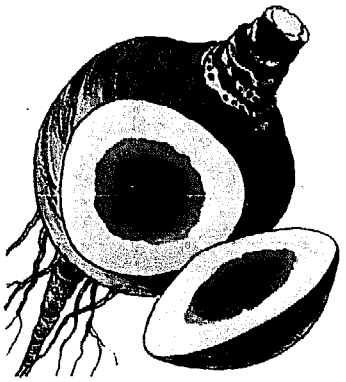
When the plants are still tiny thin them out with the hoe so as to leave one plant about every nine inches (23 cm) – deep bed method, one plant every six inches (15 cm). Leave a shorter distance for successional summer sowings which are to be eaten very young, and a greater distance for the winter main crop which is intended for storing.

## Pests and diseases

Turnips and rutabagas are subject to most of the pests and diseases which afflict cabbages and the same remedies can be taken (see Cabbages).

***Flea beetle*** When they are very young turnips and rutabagas may get flea beetle (see p. 124). This shows as tiny holes on the leaves. A good shower of rain should cure it, or a good hosing with water if there is no rain. If this doesn't work, either derris or pyrethrum dust will kill them.

***Boron deficiency*** Turnips and rutabagas are usually the first vegetables to suffer from boron deficiency. The core of your turnip or rutabaga will develop grayish-brown areas which will eventually rot and stink. A minimal amount of boron dissolved in water and added to the soil is sufficient to correct this deficiency.

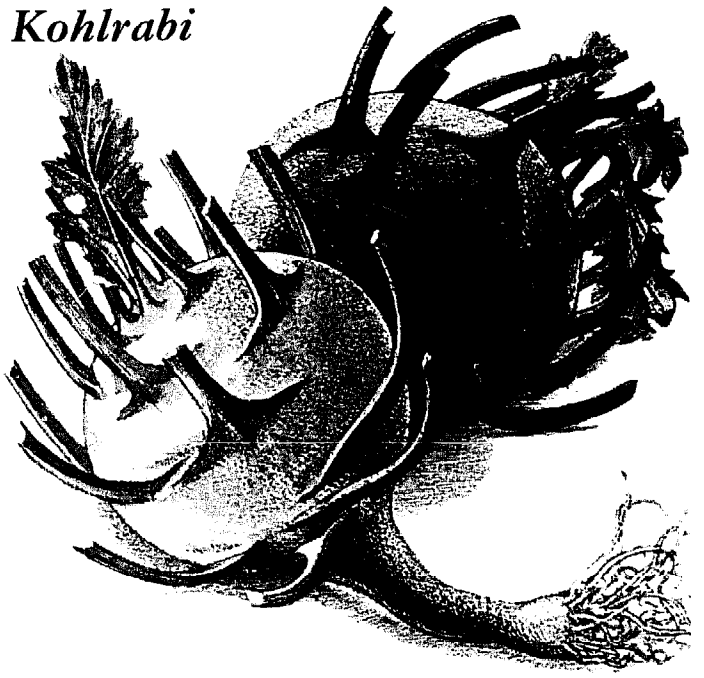


**BORON DEFICIENCY**
*Turnips and rutabagas are good indicators of boron deficiency in your soil, since they are generally the first vegetables to suffer. The core of the turnip or swede will turn a grayish-brown color and begin to rot and stink – sometimes becoming completely hollow in the center. An ounce (28 g) of boron is sufficient to restore a quarter of an acre (1000 sq m) of land. Dissolve it in enough water to cover this area.*

## Harvesting and storing

The early successionally-sown crop should be pulled during the summer when they are not more than three inches (8 cm) in diameter and are then at their sweetest. Main crop turnips should be harvested before the first very hard frosts and put in either a root store or a clamp (see p. 136). Rutabagas in all but the severest climates can be left out in the ground until they are wanted. So, eat your turnips before your rutabagas.

# *Kohlrabi*



This strange looking plant is merely a cabbage in which all the nutrients are stored in a swollen stem instead of in tight-packed leaves.

### Soil and climate

Kohlrabi likes the same conditions as other *brassica* but is even more dependent on moist soil; drought makes them hard and woody.

### Propagation

It is better not to transplant kohlrabi, but to sow the seed out where the plants will grow. Sow thinly in two or three successional sowings between late spring and midsummer.

### Care while growing

Thin the plants you want to eat in the summer to six inches (15 cm) apart – deep bed method four inches (10 cm). Those you want to store through the winter thin to ten inches (25 cm).

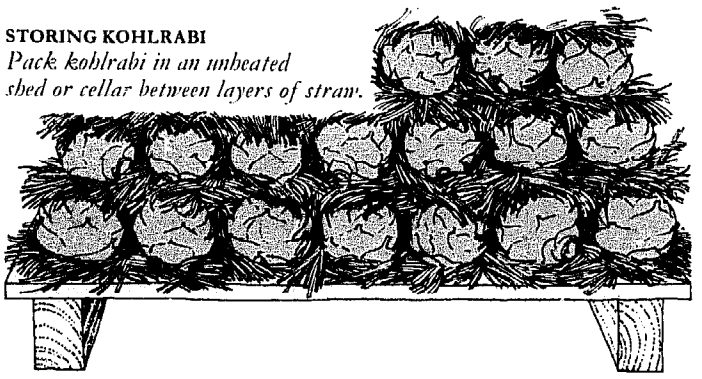
### Pests and diseases

Kohlrabi can suffer from everything that afflicts cabbages.

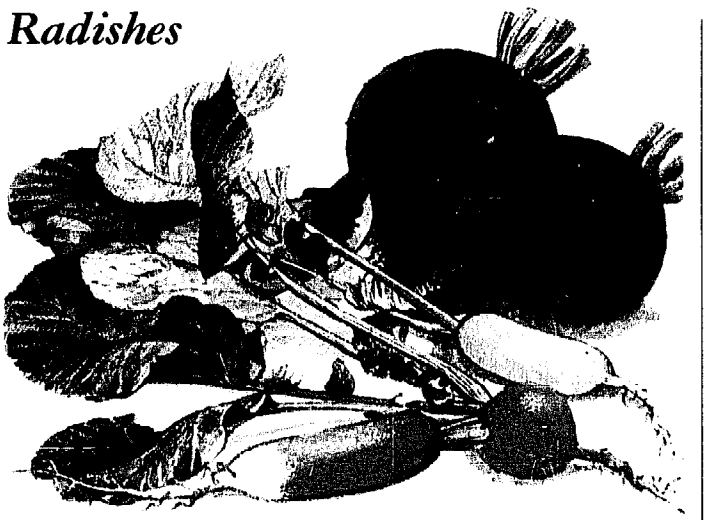
### Harvesting and storing

Pick the plants very young and tender – about two and a half inches (6 cm) across – and eat them raw or cooked. Store them, as shown below.

**STORING KOHLRABI**
*Pack kohlrabi in an unheated shed or cellar between layers of straw.*



# *Radishes*



## SUMMER RADISHES

Radishes grow in three to four weeks, are rich in iron and vitamin C and are excellent for adding bite and crispness to salads. They are good for growing in odd vacant corners, and they do well in window boxes as well. Winter radishes are larger and can be black, white, red, or red and white.

### Soil and climate

Radishes like good rich damp soil and a cool moist climate. Since they grow fast and are eaten quickly it does not matter if they are grown in beds not reserved for *Cruciferae* for they don't have time to develop diseases. In hot regions they can be grown only as a winter crop. In temperate climates they can be grown in spring, summer, and fall.

### Soil treatment

Like most *Cruciferae* they don't like acid soil, so you should lime if it seems necessary.

### Propagation

Just sprinkle the large black seeds thinly in shallow drills and cover them, or else broadcast and rake in. Sow very few at a time, but sow often – even every two weeks – so you have fresh tender radishes whenever you want them. The seeds will keep for five years, so don't throw them away. If you want early radishes, you can sprinkle them among other crops that you are forcing in a hot-bed, or in a deep bed covered with transparent plastic or glass. In the deep bed (see p. 106) sow one inch (2.5 cm) apart in each direction.

### Pests and diseases

***Flea beetle*** (see Rutabagas and Turnips).
***Root maggot*** Keep these away by scattering small pieces of tarpaper among your seedlings.

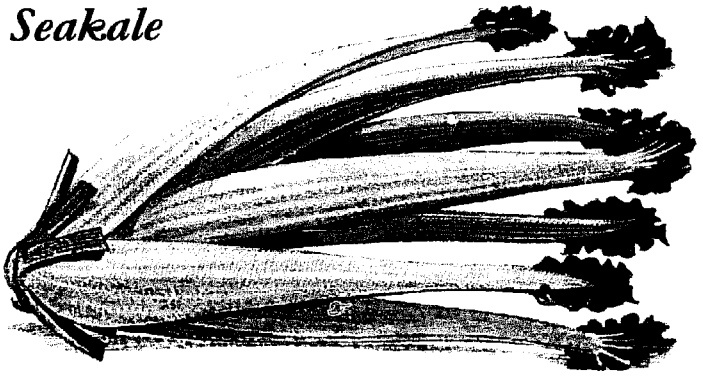
### Harvesting

Just pull, wash and eat. If you have too many, pull them out anyway. Don't let them grow up hard and woody, or go to seed. If you can't eat them, feed them to the rabbits.

## WINTER RADISHES

White radishes should be sown between late spring and mid-summer; others toward the end of the summer. They will all be ready for harvest at the end of the autumn. White ones must be dug and stored in peat. The others can be left in the ground until required during the winter.

## *Seakale*



Seakale is a perennial whose young shoots should preferably be harvested in spring, but if you so wish it can be forced for eating fresh in winter.

### Soil and climate

Seakale likes a rich deep well-manured loamy soil and a cool damp climate. Don't try to grow it anywhere hot and arid.

### Soil treatment

Dig deeply – at least two spade lengths – and incorporate plenty of rich manure.

### Propagation

Seakale can be started from root cuttings, called thongs, or from seed. The former method is preferable, because plants started from root cuttings begin to yield the second year, a year earlier than seedlings. However it is said that a new race should be raised from seed from time to time. Get your thongs from a seed dealer or a fellow gardener. They are just bits of root about four inches (10 cm) long. Plant them six inches (15 cm) deep and 30 inches (75 cm) from each other in late winter – deep bed 15 inches (38 cm) apart. If you plant from seed, sow in shallow drills in early spring.

### Care while growing

If you sow seed, thin to four inches (10 cm) apart and transplant to 30 inches (75 cm) apart the following spring.

Keep well weeded. You cannot eat green seakale because it is bitter. Therefore the plants must be blanched – that is deprived of light completely so that they go quite white. You blanch them by covering them with buckets, boxes, or upturned flowerpots with the drainage holes blocked up. If you want fresh seakale during the winter you can force its growth. Either spread hot manure over the blanching covers so as to provide heat, or take the roots from their outdoor bed in the fall and plant them in loam in a hot-bed, or warmed frame, or even in a warmed cellar. Keep your seakale warm – the soil should be 55 to 60°F (13-16°C) – and dark, and you will get a good winter crop.

### Pests and diseases

Small seedlings are occasionally attacked by flea beetle (see Turnips); otherwise they are not prone to attack.

### Harvesting

Cut shoots when they are about a foot (30 cm) high in spring, unless you have forced the plants for a winter harvest. Like all perennials that are harvested for food, seakale must be treated with respect. After you have taken what you need let it grow up into the sunshine, green and strong, and build itself up for next year.

## *Cresses*

### WATER CRESS

If your garden has a corner which is persistently damp, water cress is the ideal crop. It has the distinctive hot flavor of the *Cruciferae*.

### Soil and climate

It does best in cool climates, but will grow perfectly well in a warm one especially if it is standing in cold flowing water.

### Propagation

It is possible to create a bed, next to a flowing stream. Flood the bed by admitting water from the stream after sowing the water cress. You can grow it from seed, either planting the seed in the wet mud just above the water or sowing it indoors, in potting compost, in earthenware pots which should be kept in a tray into which water flows constantly. You can bring it to maturity like this or else plant it out in a stream or damp bed. Another method is to buy really fresh commercial water cress from the farmer's market, put it in a plastic bag with some water, take it home and plant it.

### Care while growing

Pinch out the top shoots to make the plants bushy. If a plant flowers, cut it right back.

### Pests and diseases

Never grow water cress in water to which sheep or cattle have access. If you do, you might just get liver fluke.

### Harvesting

Pick out side shoots. The more you pick, the more grow.

### GARDEN CRESS

Like mustard (see p. 199), cress is eaten in the seedling stage, although if you are growing them together remember that cress takes a few days longer than mustard to germinate. Grow it on damp sacking or a damp peat bed. Sow it thickly throughout spring and summer.

### UPLAND CRESS

Also known as American cress, this is a relatively hardy salad plant, which should be pulled after about seven weeks of growth. Sow successionally through the summer for several months' salad supply. Sow half an inch (1.5 cm) apart and later thin to about six inches (15 cm) between plants. Find a fairly shady site which will not dry out, and protect the crop under glass as the weather becomes colder.

# *Solanaceae*

*Potatoes, tomatoes, peppers and eggplants* are all members of the *Solanaceae*. There is something a little exotic about this family, for it includes such dark and midnight subjects as deadly nightshade and tobacco, as well as such luscious tropical annuals as green peppers and chilis.

But there is nothing exotic about the potato. Even that great English farmer and writer of the early nineteenth century, William Cobbett, termed it "the lazy root", for he thought it would supplant wheat, the cultivation of which he considered to be the nursery of English virtues.

The other important member of the family is the tomato. Early European explorers in America found the plant growing wild and it was regarded as highly poisonous by the Indians. It is so closely related to the potato that a hybrid has been created which has inferior potatoes on its roots and inferior tomatoes on its stems.

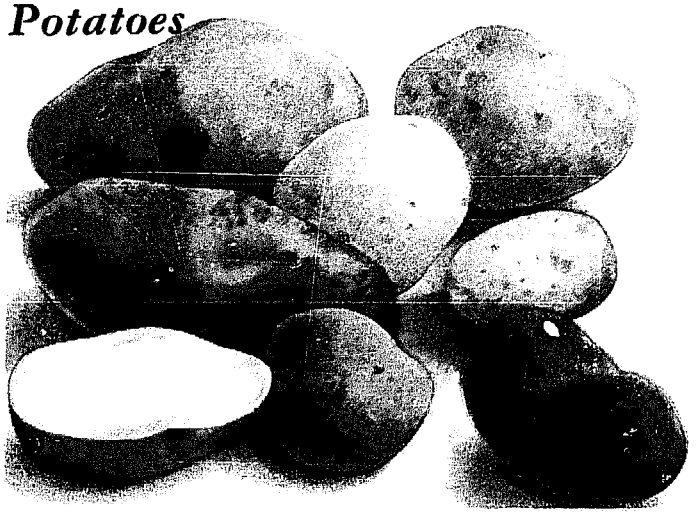
Most of the edible *Solanaceae* come from tropical south and central America and they require very rich, damp and fertile soil, as similar to the rich leaf-mold of the tropical jungle as possible. Furthermore, none of the food-bearing *Solanaceae* are frost-hardy, which means, if you live in a cool climate, you must either start them off indoors, or not plant them until all danger of frost is past.

The *Solanaceae* have several pests and diseases in common and it is therefore advisable to grow them all in the same bed, or in the same part of the rotation. In this way your land is given a rest from solanaceous plants for the full cycle of four years, and there is no chance for disease to build up or for pests to accumulate. Certain eel worms, for example, can multiply to frightening proportions if tomatoes and potatoes are grown too often on the same land. Never touch any solanaceous plants when your fingers have been in contact with tobacco, because tobacco is a member of the *Solanaceae* and frequently contains virus disease.

One of the great values of most plants of this family is that they are rich in vitamin C. Potatoes are the richest source of this for most inhabitants of temperate regions, and chilis are the richest source in many parts of the tropics. The reason why Asians eat hot curry is not to cool them down, but to provide themselves with vitamin C.

All in all life would be much poorer were it not for this tribe of strange, soft-stemmed, potash-hungry, tropical-looking plants.

## *Potatoes*



The potato is one of the few plants on which a person could live if he could get nothing else; and, unlike the others, it requires very simple preparation: no threshing, winnowing, grinding, or any of the jobs that make grain consumption a difficult technical operation.

Self-sufficiency from the garden in temperate climates is unthinkable without the spud, and I would recommend anybody, except those with the tiniest of plots, to devote at least a quarter of his land to it, and preferably as much as a third. Being a member of the family, *Solanaceae*, it provides the soil with a rest from those families which are more commonly represented in our gardens. Without the potato break we would find ourselves growing *brassica*, for example, far too frequently on the same ground.

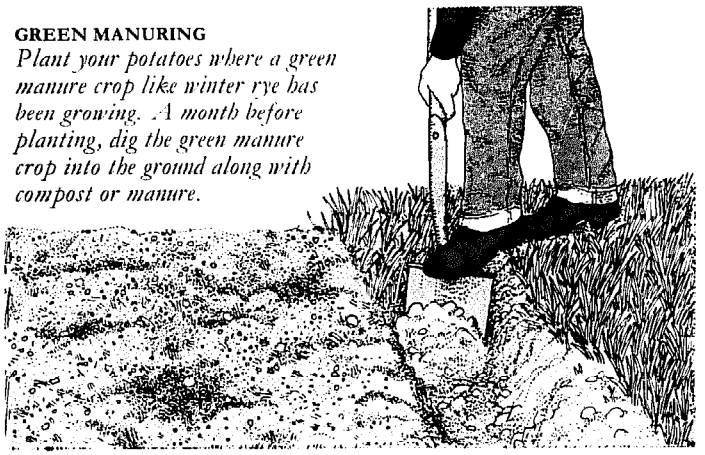
### Soil and climate

Never lime for potatoes. They thrive in an acid soil: anything over a pH of 4.6. Scab, which makes them unsightly but doesn't really do them much harm, thrives in alkaline conditions but is killed by acidity. Potash is essential for good potatoes (but if you put on plenty of manure or compost you will have enough of that) and so is phosphate. Nitrogen is not so important, although a nitrogen shortage (unlikely in a good organic garden) will lower your yield.

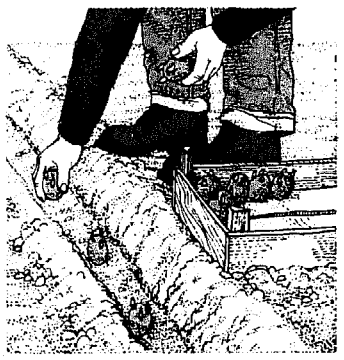
Unfortunately the potato did not originally evolve for the climates of the northern hemisphere. It evolved in the Andes, and the wild potato is a mountain plant, although tropical. Its provenance makes it very frost tender; the least touch of frost will damage its foliage and halt its growth.

### Soil treatment

It is well worth digging the soil deeply the previous fall, and incorporating a heavy ration of manure or compost while you're at it; 8 cwt (400 kg) per 100 sq yds (84 sq m) is about right. Another excellent thing to do is to broadcast some green manure crop, such as rye, the previous autumn after your root break. If you do this you should leave the crop undisturbed until a month or two before you want to plant your potatoes – unless, that is, your green manure is clover in which case you should dig it in in the autumn. In any case dig the green manure crop well into the ground and at the same time dig in compost or manure. Or, and this works perfectly well, you can, if you have been short of time in the winter or if the weather has not enabled you to dig, actually dig the green manure crop in at the time of planting the potatoes. Throwing any available compost or muck into the bottom of the furrow, plant the potatoes on top of this and fill in with the green manure.



**GREEN MANURING**
*Plant your potatoes where a green manure crop like winter rye has been growing. A month before planting, dig the green manure crop into the ground along with compost or manure.*



**SOWING EARLY POTATOES**
*Make a trench five inches (13 cm) deep with a hoe, put in manure or compost if you have it and put the seed potatoes in, rose-end up, about a foot (30 cm) apart.*

**COVERING EARLY POTATOES**
*Three to four inches (8 to 10 cm) of soil is enough covering for newly-planted early seed potatoes. You'll be hilling them up later on anyway.*

## Propagation

I know of nobody who grows potatoes from actual seed, although potatoes set seed in little green fruit that look just like small tomatoes. It is better to use sets which are, in fact, just potatoes, although they are called "seed". If you plant a potato it will grow into a potato plant which produces between six and a dozen more potatoes. (The actual potatoes, by the way, are not *roots* – they are swollen underground *stems*.)

Potatoes grown in temperate areas toward sea level are heir to certain diseases which are the price they pay for growing in the wrong place. Among these are certain virus diseases which are transmitted by aphids. If you plant potato "seed" you will probably get a good crop of potatoes. But if you plant them where aphids abound, and you plant the new generation of sets from them the next year, the crop is likely to be slightly less. If you go on for a third year, and a fourth year, the crop will diminish even further. This is because there is a build-up, with every generation, of the virus diseases introduced by aphids. The remedy is to get your "seed" from people who grow potatoes in places where there are no aphids. In practice "seed" potatoes must be grown above a certain altitude, or else on some wind-swept sea island where aphids wouldn't have a chance. The specialist seed growers carefully "rogue" the potato plants as they grow (that is pull out any weak or diseased potatoes) and protect them from infection. The tubers that they lift for sale to their customers are therefore disease-free seed.

All this does not mean that you cannot keep and plant your own tubers. Most people do, and you can even buy "once-grown" or "twice-grown" seed from your neighbors. And if you have land at over 800 feet (240 m) in the northeastern US, or on a sea-girt island, you can probably grow "seed" for ever, both for yourself and to trade for other goods with your neighbors. Seed potatoes should, ideally, be about 1½ ounces (42 g) in weight. You can cut larger tubers in half, provided you leave some "eyes" (small shoots) on each half but I don't like doing this as it can let in disease. Ideally seed should be "chitted" before being planted. That is, it should be spread out, one spud thick, in a cool place, and in diffused light. Don't allow frost to get to it (frost will immediately rot potatoes) and keep it out of hot sunlight. If the place is too hot and dark, long gangly shoots will grow off the potatoes and tend to break off before you plant them. (If you *can* plant them without breaking these shoots off though, the potatoes will grow very well.)

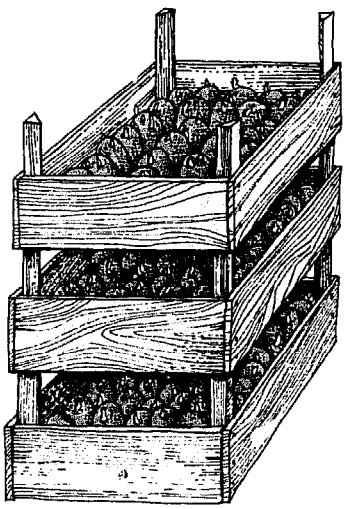
So the best thing to do with your seed potatoes is to lay them in chitting boxes in midwinter. These will stack one on top of the other and admit light and air to the potatoes, and can be carried conveniently out to the garden for planting.

***New potatoes*** New potatoes grow very quickly and can be eaten straight from the ground. They are not for storing. Plant them as early as you can, but remember that frost will kill them once they appear above the ground, unless they are protected with cloches or a thick covering of straw or compost. If they get frosted you may be able to save them by hosing the frost off with warm water.

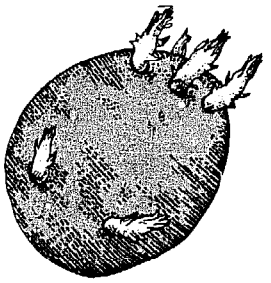
***Main crop*** Your store of "main crop" potatoes will go a long way toward keeping you alive during the winter. Plant them in late spring.

Chitting is almost essential for new potatoes, but if you don't get round to chitting for your main crop, never mind, plant them just the same. You will still get a crop – it will be later, that's all. And never plant any diseased tuber, or one that looks defective in any way. You will simply be spreading disease among your own crops, as well as those of your neighbors.

Don't put new potatoes in too deep: if they have four inches (10 cm) of soil over them when you have finished, that is enough. If the land has been dug before, that is, if you are not digging it for the first time since the previous fall, just make a furrow with the corner of a hoe, about five inches (13 cm) deep, put the potatoes in, and cover with about



**CHITTING SEED POTATOES**
*Place seed potatoes in single layers in chitting boxes. Put the seeds in "rose-end" up – the end with the most eyes. Protect from frost and direct sunlight. Before planting rub off all but three sprouts at the "rose-end".*



**USING A POTATO PLANTER**
*If your soil is light, loamy or sandy, you can save yourself some toil by using a potato planter. Ram it down into well-dug ground with your foot, drop a potato into the cup, then close the cup by pushing the handles of the planter together. Withdraw the planter, and the potato will be left buried in the ground. The method isn't quite as good for the potato as simple trenching, but it is easier and quicker. The potato planter is useless for sowing in heavy soil or clay, but it is ideal for the deep bed method.*

four inches (10 cm) of soil. You will hill them up well later, and do not want the crop to grow inconveniently deep in the ground. If you have light, loamy or sandy land you would do well to get a potato planter, which is also the ideal thing for the deep bed method (see p. 106).

For new potatoes have the drills about two feet (60 cm) apart, but have them 30 inches (75 cm) for main crop. Put earlies in a foot (30 cm) apart in the rows: main crop about 15 inches (38 cm). Remember main crop have much longer to grow and produce much bigger and heavier crops.

Now there are other methods of planting potatoes. One excellent one is to plant the potatoes on compost, cover them with more compost and then a thick mulch of straw or spoiled hay. Or you can use leaves or leaf-mold in this way with good results. If you grow new potatoes with this method you can gently remove some of the mulch, take a few potatoes, and let the plant go on growing to produce some more. All these mulch-cover methods do great good in that they enrich the soil for other crops after the potatoes are finished. As you rotate your potato crop around your garden the whole holding becomes enriched.

A very effective method, which has the advantage that it can be done in a small space – even on a patio – is to grow potatoes in a barrel. Fill the bottom of a barrel with a thin layer of earth and plant a single "seed" potato in it. Keep adding more soil as the plant grows upward and you will find that more and more tubers will form in the new soil.

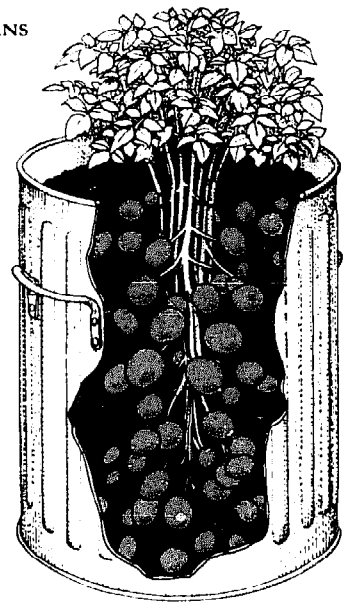
**PLANTING ON COMPOST**
*Put a good layer of compost in the furrow, and plant the potatoes on top. Cover them with compost, then mulch with straw.*

**HARVESTING FROM COMPOST**
*Lift some of the mulch, pull a few potatoes and replace the mulch. The plant will go on to produce the main crop.*

Finally the green plant will be sprouting out of the top of the barrel. Wait for the plant to flower and then simply empty the barrel out. You will find a huge number of potatoes in it.

You can work the same principle to even better effect by laying an old car, truck or tractor tire on its side, filling it with earth and planting one or more potato sets in it. When the plants have grown, but before they flower, add another tire and fill it with earth. Allow the plants to continue growing. Keep adding tires until the plants reach about four feet (1.2m). Then harvest by dismantling the whole structure. This is better than the barrel method because the plants have plenty of light throughout their growth. Painting the tires white makes them more attractive.

**GROWING POTATOES IN TRASH CANS**
*Growing potatoes in trash cans is particularly useful is your space is limited – even a patio will do. Take an old can, and fill about a sixth of it with earth. Plant one or more potato sets. When the plants have grown, but before they flower, put another layer of earth on top. Continue building up layers of earth as the plants appear until they reach about four feet (1.2 m). When the potatoes are ready for harvesting, simply empty out the bin and you'll find you have a surprisingly heavy crop.*

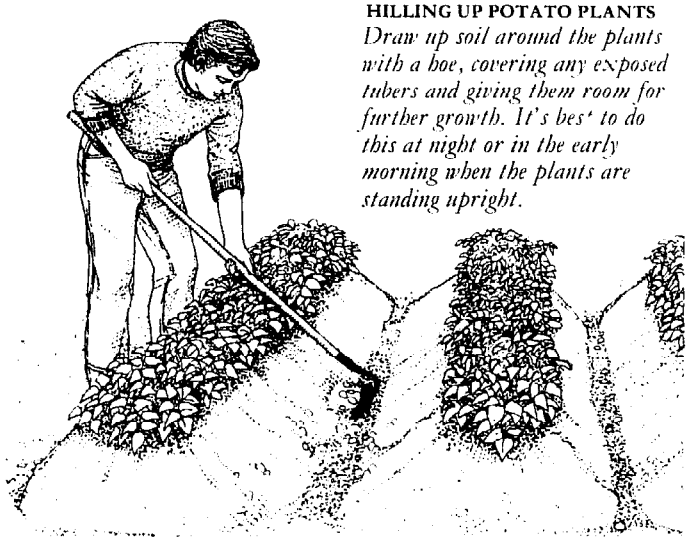


If you plant in a deep bed you should get an enormous crop. You can plant 18 inches (45 cm) deep. And in the very soft earth of the deep bed you can plant with a potato planter. Leave a foot (30 cm) between potatoes.

### Care while growing

Potatoes need a lot of room under the ground, and they will turn green if exposed for more than a day or two to the light, in which case they become bitter and poisonous. This is because they produce a toxin called solanin. It is usual therefore to hill them up, that is to draw or throw earth up around the plants so as to protect the growing tubers from the light and give them plenty of room for growth and expansion. Of course people who grow beneath a mulch don't have to do this, but they do have to make sure that there is plenty of mulch to cover the potatoes completely. Potatoes do not like weed competition, and in the very rich, deeply cultivated soil that they grow best in, weeds grow at an amazing rate. When you ridge up you must be sure to kill the weeds. When weeds sprout up on the ridges between the potatoes you must either hoe them out or pull them by hand. Throw them down in the furrows to rot and they will help by forming a mulch.

One tip about hilling up potatoes: for some reason the plants stand upright at night and in the early morning, but sprawl helplessly during the heat of the day. Potatoes are far easier to hill up early in the morning when they are standing up like soldiers on parade. Like real soldiers, when the sun



**HILLING UP POTATO PLANTS**
*Draw up soil around the plants with a hoe, covering any exposed tubers and giving them room for further growth. It's best to do this at night or in the early morning when the plants are standing upright.*

gets hot they are inclined to faint. You may have to hill up several times; the final one should be thorough, the ridges patted down with the back of the spade and made steep and even, for in this way they defy the spores of potato blight should this disease strike (as it very likely will).

When the tops of the main crop meet over the rows they will suppress weeds and, after the final hilling up, you can relax for a while.

**Pests and diseases**

***Potato blight*** The degree of blight trouble depends largely on the section of the country and weather conditions. Wet seasons favor the disease, which shows first as water-soaked areas on the leaves with a mold on the underside. The spores are dropped from the leaves and washed down into the soil where they infect the tubers which go soft and rot. Late blight which is caused by *Phytophthora infestans* is probably the most generally destructive potato disease. In 1845 it swept right across Ireland causing the deaths of nearly a million people.

No cure was found for blight until toward the end of the last century somebody noticed that potatoes growing downwind from copper smelting plants did not get blight. So could copper prevent this dreaded disease? A mixture of copper sulfate and lime was tried – similar to the mixture already being used by the vignerons of Bordeaux against mildew on their grapes. It was found that if the foliage was sprayed with this at "blight times" – when the temperature and humidity of the air were above a certain point – the foliage was protected from the drifting spores of the blight. So now, to avoid blight I spray, very thoroughly above and below the leaves, with Bordeaux mixture, and I do it about once every two weeks throughout the hot and humid weather of the summer. If you are in a dry windy area you may not get blight. Ask your neighbors. You can buy a proprietary spray or else mix up your own Bordeaux mixture (see p. 105).

And what if you do get blight? You will know by black patches which appear on the leaves, and thereafter develop borders of white powdery stuff which is, in fact, the spores of the fungus which causes the disease. You cannot cure it by spraying then, although you may protect healthy plants from its spread. But do not despair. Unless the attack is a very early one the spores will not spread down to your tubers, and if you have earthed up well, spores that are washed down by the rain will not sink into the earth and come into direct contact with the tubers. You must cut the haulms (foliage) off with a very sharp blade (sharp so as not to drag the potatoes out of the ground) and burn them. It is sad for an organic gardener to have to say burn anything, but – yes – burn them. Then leave your tubers undisturbed in the ground for at least three weeks after you have removed the haulms. If you lift them immediately they will come into contact with billions of spores on the surface of the soil. If you leave them be the spores will be washed down the steep sides of the ridges into the furrows where they will sink harmlessly into the soil below. Leave the potatoes for as long as possible. In the moderate climate where I live I often don't lift them until I need them to cook – even after Christmas sometimes. They are safer there in the ground than they are if I lift them.

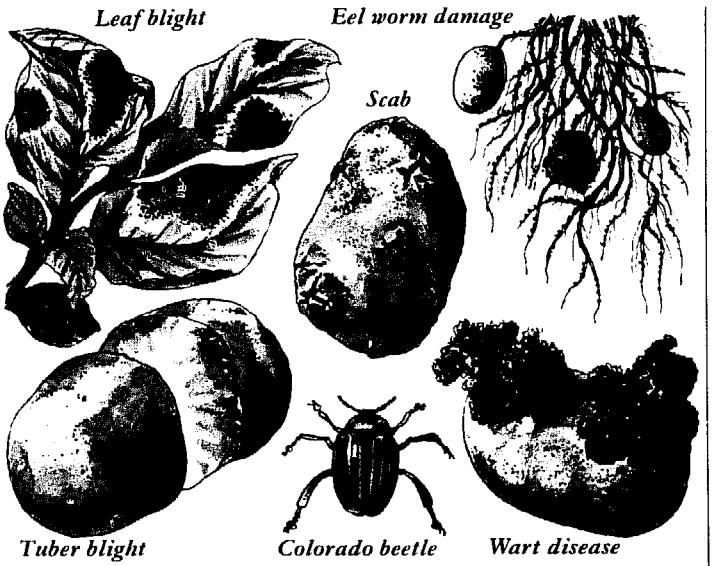
***Wart disease*** The disease manifests itself by wartish growths which look like dirt on the surface of the potato. The cooking quality is not affected but if such potatoes are used for seed the seedlings may be girdled and die. The disease manifests itself by wartish growths that can cover the surface of the potato. Burn all such potatoes. I have grown wart-free potatoes for a lifetime, but when it does infest your ground you should plant only immune varieties. Otherwise don't grow potatoes for six years on that land and just hope the disease will die out. 65 pounds (30 kg) of quicklime per 100 sq yds (84 sq m) of infected land are said to kill it.

***Scab*** You will probably get this if you grow potatoes in very alkaline soil or in soil that has been recently limed. It is not serious. If you want to sell potatoes it matters, for they don't look nice. If you just want to eat them don't worry about it; simply peel the scab off. But plenty of manure or compost will prevent scab, so organic gardens simply shouldn't have it.

***Potato root eel worm*** This attacks chiefly the monoculturalists who grow potatoes on the same soil year after year – or at any rate too frequently. Don't grow potatoes too often on the same soil. If you get it really badly you will have to give up growing potatoes there for at least ten years, although it is said that if you grow several crops of *Tagetes minuta* on the land, and compost it, or dig it in as green manure, it will suppress eel worm. And, if you grow a crop of *Tagetes minuta* the year before planting potatoes, it will fool the eel worm cysts, by its secretions, into remaining dormant during the tenure of the potato crop.

***Colorado beetle*** This is yellow with four black stripes on its back. It hibernates deep in the soil and emerges in early summer to lay its eggs on potato foliage. The grubs then eat the leaves and can easily destroy a whole crop. Potatoes grown on a very large scale are the most susceptible. If you

**SPRAYING FOR BLIGHT**
*During hot and humid weather you can protect your potato crop against blight by spraying over and under the leaves every two weeks or so with Bordeaux mixture. If some of your crop is affected in spite of this, continue spraying the healthy plants, so that the disease is prevented from spreading.*




do see a beetle on the leaves squash it, and immediately notify the nearest Agricultural Agent, and take his advice. The grubs can be sprayed with derris, pyrethrum or, best of all, nicotine. Deep dig in the winter to expose the beetles to attack by birds.

The other diseases of the potato (and there are over a hundred) should not be a problem provided you use only clean, healthy seed and grow on heavily manured or composted ground, preferably not more than once every four years. Don't suffer "volunteers" to exist; that is plants which have grown up from potatoes which you have inadvertently left in the ground. They will only cause a build-up of disease.

### Harvesting and storing

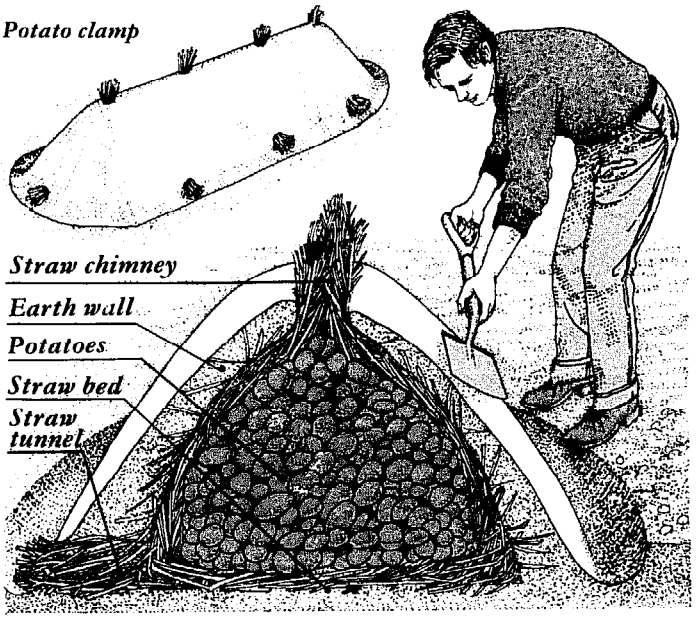
You can harvest any time after the plants have flowered. Dig potatoes carefully with a fork, taking great pains not to spear any, and if you do spear any, eat those first, for if you store them with the others they may cause rot. You can scrape and eat new potatoes immediately: just dig them as you want them half an hour before a meal. New potatoes have a lot of their carbohydrates in the form of sugar, because they are still busy growing and must have their energy in a still soluble form.

Main crop potatoes, however, have ceased to grow, and the sugar has all turned into starch, which is really what potatoes are. So lift your main crop potatoes as late as you like but before the very hard frost sets in, and preferably in dry weather. By then the tops will have wilted and dried. Leave the potatoes lying on top of the ground for a day or two for the skins to "set", or harden, and the potatoes to dry. Don't leave for longer, because potatoes left too long in the light will grow green and become bitter and poisonous, but two days won't hurt. If you have a lot of potatoes – say a ton (1000 kg) or more — you can clamp them. That is pile them in a steep-sided heap, cover with straw or dry bracken, and then cover with earth. The colder your winters the thicker the covering of straw you will require. In places with very cold winters you cannot clamp at all because the potatoes will become frosted. Leave small chimneys of straw sticking out on top of the ridge of the clamp every two yards or so, and build straw-filled tunnels at similar intervals around the base. Beware, a thousand times beware, of rats. If they make their homes in your potato clamp, it's good-bye to your potatoes.

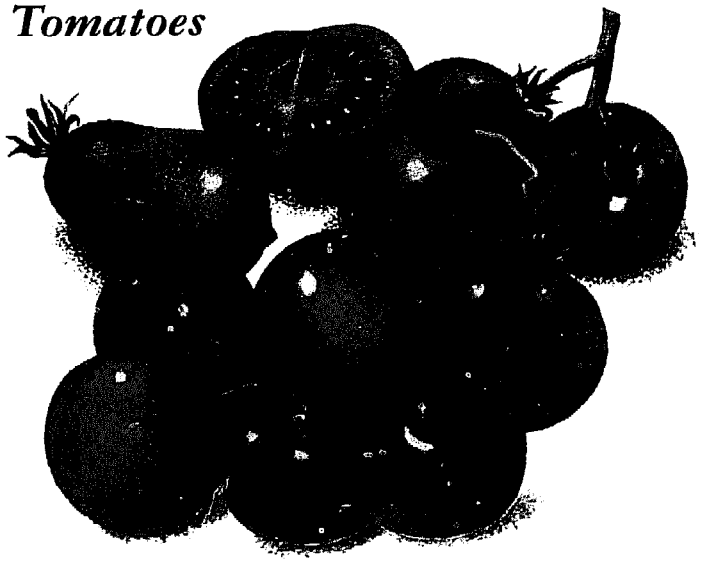
If you have less than a ton (1000 kg), or live in a very cold climate, store your potatoes indoors. The requirements are: they should be in complete darkness; they should be ventilated; they should be as cold as possible but not subjected to frost, which rots them. So, a plastic or metal garbage can with a few ventilation holes knocked in the top and bottom will do, or else wooden tea chests, or barrels, but again, with ventilation. And in fact your potatoes will come to no harm if you just leave them in a heap in a completely dark corner of a frost-proof cellar or shed. Sacks are no good, except for certain open-weave man-made fiber sacks; "gunny", jute or canvas will rot, and so will paper.

The root cellars which are found in the northern states are ideal for very hard winters. In most parts of the USA the clamp is the best way of storing potatoes in large quantities, and on the whole it is the method of storing I prefer.

**DIGGING AND CLAMPING**
*Harvest your early potatoes at any time after the plants have flowered. Late potatoes can be left in until the plants have died down. Dig potatoes out carefully with a fork, making sure you don't spear any. If you do, don't store them because they will very likely cause rot. If your crop is large – say over a ton (1000 kg) – it can be stored in a clamp, (right). Pile your potatoes steeply on a bed of straw, cover with more straw and mound over with earth. Ventilation is important, so make small chimneys of straw every two yards along the top of the clamp, and insert straw tunnels at the same intervals at ground level.*



# Tomatoes



Like the potato, the tomato is [illegible] tropical America. It is a perennial, but in temper[illegible] where it is only half-hardy, it is grown as an an[illegible] tomato has enormous value for the self-sufficien[illegible], for not only does it improve any dish to which [illegible] it is also a very rich source of a whole range of vitamins and, most important, these do not seem to be damaged a great deal by cooking or canning. If you grow enough tomatoes in the summer to have them canned all winter you will not suffer from vitamin deficiency.

## Soil and climate

To grow tomatoes out of doors you must have at least two and a half months of warm weather with plenty of sunshine. If you don't live in this sort of climate, you must start them off indoors and plant out in the late spring. If the summer turns out too cold or cloudy to bring them to ripeness, they can be ripened indoors or else made into green tomato chutney. In cold or temperate climates they grow well in greenhouses, and are far and away the most valuable greenhouse crop. But remember that, unlike cucumbers, they do not like a lot of humidity.

Tomatoes do well in any rich soil. In light soil they will give an earlier crop than in heavy soil. On the other hand they grow well in heavy clay that has had several years of compost application.

## Soil treatment

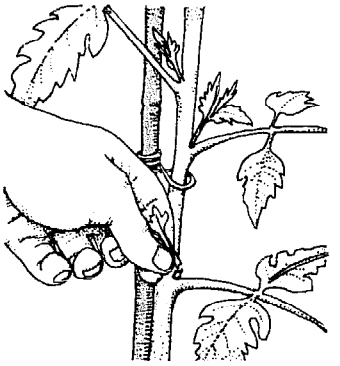
For each seedling I like to dig a hole about a foot (30 cm) deep and as wide across, and fill it nearly to the top with compost, as though I were planting an apple tree. Then I fill the hole up with earth and when the time comes plant out in that. It is best to do this about six weeks before planting out. In fact it is a good idea to prepare the holes at the same time as you sow the seed indoors. However you manage it, tomatoes need rich soil, with plenty of good rich manure or well rotted compost. As the compost rots and settles, the ground sinks a little around the roots, which helps the tomatoes retain water.

## Propagation

Except in very hot climates sow the seed indoors in seed boxes during spring. In all but the coldest climates an unheated greenhouse will do; a temperature of 70°F (21°C) is ideal. Sow thinly in either a proprietary compost, or a mixture which you can make yourself (see p. 92). Cover the seed boxes with newspaper during the night, but in the day make sure they are in full sunlight. Two or three weeks after sowing prick the tiny plants out three inches (8 cm) apart in larger seed boxes or, better still, peat pots. Again use proprietary compost or your own mixture. Don't water too much; keep the compost slightly on the dry side – just dry-to-moist. And always give them all the sun there is.

After a month start gently hardening the plants off. Put them outside in the sun in the day but indoors at night, or else move them to cold frames and keep the covers on at night but off in the day. At the beginning of summer they should be sufficiently hardened off for planting out in their prepared holes. If you have cloches plant your tomatoes out two weeks earlier and keep them covered for that period.

**PLANTING OUT SEEDLINGS**
*Avoid disturbing the soil around your tomato seedlings. Two weeks before planting out, cut squares around each plant in the seed box, so as to keep the soil intact when it comes to planting.*



**PINCHING OUT SIDE-SHOOTS**
*With your fingers, pinch out the little shoots which emerge at the point where the leaf stalks meet the main stem.*

## Planting out

You should provide tomatoes with adequate vertical support, because by nature they are trailing plants. The best way is to use stakes, at least five feet (1.5 m) tall. Sink them about a foot (30 cm) into the earth. Position the stakes when you plant out the tomatoes, but don't damage the root clusters. Plant the tomatoes quite deeply so that the lowest leaves are just above the ground. Tomatoes are liable to put out adventitious roots from their stems and this should be encouraged. If you have any long straggly plants, you can make them stronger by laying a length of the stem horizontally in the ground; the stem will send out new roots.

Spacing depends on what sort of plants you intend to grow. In cooler climates plants should be kept small, and two feet (60 cm) apart in rows three feet (90 cm) apart is about right. In warmer climates they can grow larger, so more space should be allowed. In hot climates you can let them sprawl and then plants should be four feet (1.2 m) apart. If you use the deep bed method (see p.106) allow two feet (60 cm) between plants.

A method which is worth trying in a small garden is to plant out leaving only a foot (30 cm) between rows. Then stop the plants when they have set one truss only and allow no side-shoots to develop. This sounds ruthless but you should get more ripe tomatoes than with usual methods.

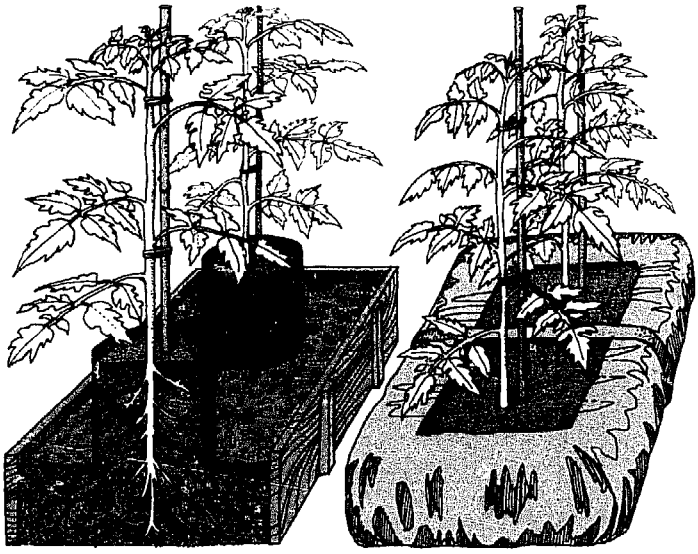
When planting out take great care to disturb the soil around the roots as little as possible. If you are using peat

pots, just soak the plants and plant the peat pots as they are. If you use seed boxes, cut the soil in squares around each plant down to the bottom of the tray with a knife. Do this two weeks before you plant out, and try to retain that soil intact when you plant.

***Ring culture*** Ring culture is another way of growing tomato plants from seedlings. It is best practiced in the greenhouse, though it can be done outdoors. The method is worthwhile if you are short of soil or short of space, or if your soil is disease-ridden.

Two weeks before you want to plant your seedlings stand rings of plastic or linoleum nine inches (23 cm) in diameter and nine inches (23 cm) high on a bed of clean gravel. Fill with proprietary compost or your own mixture (see p. 92). Two days before planting, water the gravel and the rings with water in which a complete organic compost or manure has been steeped – a thick soup in fact, and lace it if you can with a little fish meal.

When you plant the seedlings water the rings with ordinary water, and continue watering through the rings only for the next ten days. After that, when the roots have reached the gravel, water the gravel only, and ensure that it is permanently moist. Once a week give the gravel a good soaking with your organic soup. Otherwise treat like ordinary tomatoes.



**THE RING CULTURE METHOD**
*Stand rings of plastic or linoleum on a bed of clean gravel, fill with potting compost, and plant seedlings. Feed the plants with organic compost or manure steeped in water. After ten days water the gravel only.*

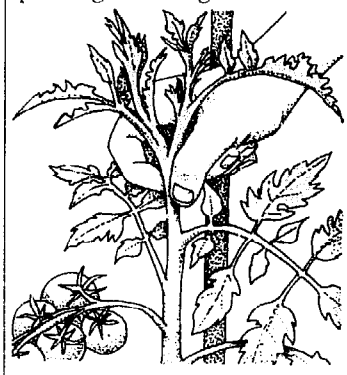
**PLANTING IN PEAT BAGS**
*Plant four seedlings in a commercially-prepared peat bag or in an old fertilizer bag filled with peat. Take care with watering since the bags won't drain and the plants may become waterlogged.*

***Peat bags*** This is a space-saving method which works indoors and outdoors, and is especially good for people who have just a patio or a balcony. Buy a specially prepared bag or simply fill an old fertilizer bag with peat. Plant four seedlings in each bag and water carefully; there is no facility for drainage so the plants can easily get waterlogged.

## Care while growing

Tie the plants loosely to their stakes with soft string and keep tying as they climb. Don't tie too tightly or you will cut the stems. An excellent alternative is to drop a tube of wire netting, about 15 inches (38 cm) in diameter over each plant. The plants will climb inside the tubes.

Pinch out the little shoots which spring up at the base of each leaf stalk; otherwise you will get an untidy straggling plant which probably won't set any fruit. And don't let your plants get too high.



**KEEPING TOMATO PLANTS LOW**
*Four trusses on each staked plant are enough. To stop them growing higher, simply break off the tops above the fourth truss.*

**AUTUMN RIPENING**
*When the nights draw in, take the plants off their stakes and lay them on straw under cloches. Tomatoes must be warm to ripen.*

Tomatoes do not want too much water but they want some; if the ground dries right out, the fruit will crack. The very best thing to water the plants with is liquid manure. (Make it by half filling a barrel or tank with farmyard manure and topping up with water.) Remember that tomatoes need warm roots, so nip the bottom leaves off and train the plants as upright as possible so that the sun can get to the soil round the roots. In the fall when the nights begin to draw in, it is a good idea to take the plants off their stakes, lay them down horizontally on straw and cover them with cloches. This certainly helps to ripen the fruit.

## Pests and diseases

***Blight*** Outdoor tomatoes are just as susceptible to potato blight as potatoes are, so spray your tomatoes with Bordeaux mixture (see p. 105). Spray once every two weeks during the warm summer weather, and if it pours with rain just after you have sprayed, spray again.

***Cut worm*** (see p. 124).

***Horn worm*** Green worms devour leaves. Squash them.

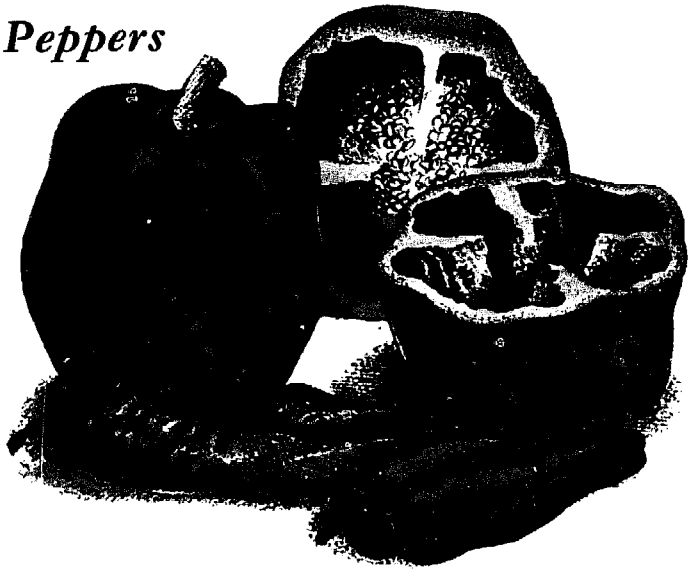
***Blossom end rot*** Large watery spots turn black at the blossom end of the fruit. This can be prevented by cultivating and watering well.

## Harvesting and storing

Pick the fruit gently with the stalks on and take great care not to damage the skin. Red tomatoes must be eaten fresh, or must be canned immediately.

Green tomatoes, or tomatoes which are not quite ripe, can be covered with cloth or paper and kept in a cool place until they ripen. They must be in the dark: never lay them in the sun. A time-honored method is to lay a sheet of soft felt in the bottom of a drawer in a cool room, lay a layer of tomatoes on top of it making sure none of them are touching each other, lay another piece of felt on the tomatoes, then more tomatoes, and so on. Lay the greenest at the bottom and the ripest on top. Be sure the tomatoes are all healthy or you may end up with a drawer full of mold. Green and ripe tomatoes can be stored as chutney (see p. 218).

## *Peppers*



Peppers are divided into two groups: sweet and hot. They are among the most ornamental plants in the garden and come in many shapes, colors and sizes.

### Soil and climate

They are slightly hardier than tomatoes. You can grow them out of doors in warmish climates, but they are better started off under glass, and can do all their growing under glass. They need at least 65°F (19°C) when they are flowering or they won't set fruit.

### Soil treatment

They prefer a light soil and benefit from compost.

### Propagation

You can buy seed, but I think it is much better to buy some ripe red peppers of the kind you like best, break them open and take the seed out. Sow the seed indoors at least six weeks before the last expected frost. Sow a few seeds in each pot and when they are about five inches (13 cm) tall thin to the strongest one. Plant outside about three weeks after the last expected frost (two weeks earlier if you have warmed the ground with cloches) in beds prepared as if for tomatoes (see Tomatoes). Like tomatoes plant them deeply.

### Care while growing

Treat just like tomatoes but give them more water while they are young. Always water the roots, never the peppers; if they get too wet, they are liable to rot. Mulch heavily.

### Pests and diseases

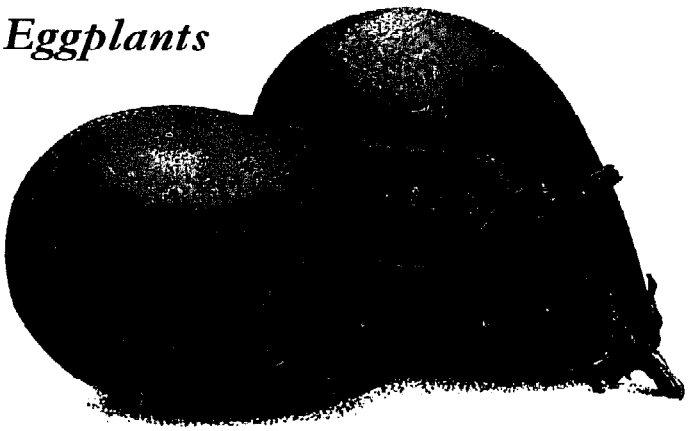
***Anthracnose*** As long as you plant your peppers well away from your beans, they will not suffer from anthracnose. If they do get it, they will go bad. Burn them.

***Cut worm*** Protect your seedlings with cardboard collars (see p. 124) when planting out.

### Harvesting and storing

Cut them off (don't break them) with an inch (2.5 cm) of stem on each fruit. If you have more than you can eat fresh, hang the vines up in a dry windy place to dry. You may have to finish the drying process by hanging them over mild heat indoors. You can then just hang them, decoratively, in your kitchen or store room until you want them in winter.

## *Eggplants*



Even the most dedicated flower gardener has to appreciate the eggplant. As well as their luscious fruit they have luxuriant purple flowers and large velvety leaves. They are not high in nutrition, but they make up for this with their unique flavor.

### Soil and climate

In warm frost-free areas the eggplant will grow as a perennial bush, but where there is the slightest touch of frost it must be grown as a tender annual. It needs a hot summer and deep rich soil with plenty of moisture, but it does not thrive in wet weather.

### Soil treatment

Dig plenty of manure or compost into your soil. Eggplants like a pH of about 6.

### Propagation

Sow the seed indoors about ten weeks before you plant out. Soak the seed overnight and then plant each seed in a peat pot filled with good potting compost. If you have no peat pots, sow an inch (2.5 cm) apart in seed boxes filled with potting compost. When the seedlings are two inches (5 cm) high, plant out into even richer compost four inches (10 cm) apart in seed boxes or in a cold frame.

When your plants are about ten weeks old, and the ground outdoors is warm to the hand, plant the peat pots out three feet (90 cm) apart – 18 inches (45 cm) apart if you have a deep bed (see p. 106). Take great care not to damage the roots.

### Care while growing

Until the warm weather comes keep cloches over them if you can spare them, and if you have a deep bed use mini-greenhouses. Keep them well watered – with manure water (see p. 90) if possible – but don't over-water.

### Pests and diseases

***Flea beetle*** These pests may attack when the plants are young. The leaves are quickly eaten away if they are not checked. Use derris dust to get rid of them.

***Mildew*** The plants may get a mildew in damp climates. The answer is to reduce the humidity in the air, so that the mildew dries up. If your plants suffer much, try in future to use fungus resistant strains.

### Harvesting

Cut them off – don't pull them – as soon as they have that lovely high gloss and before they are fully grown. The plants will then continue to fruit.

# *Umbelliferae*

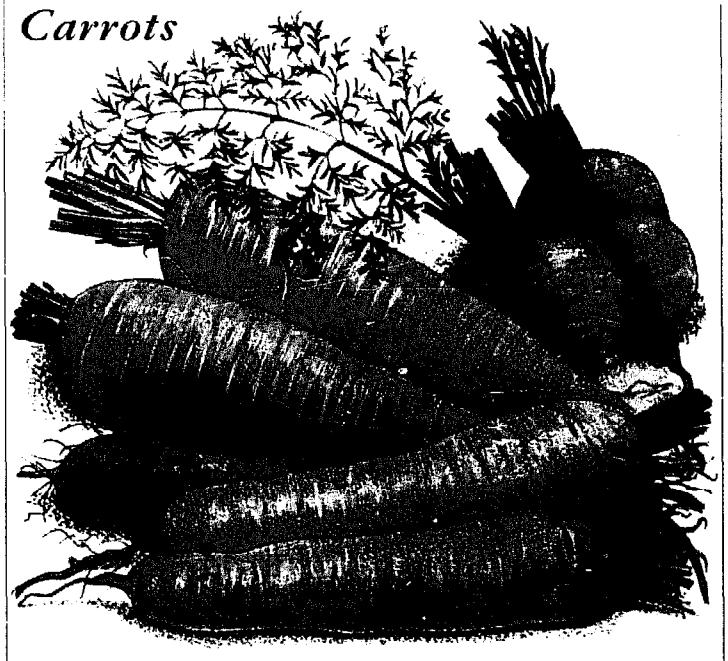
*Carrots, parsnips, celery, celeriac, Hamburg parsley and Florence fennel* are all members of the *Umbelliferae*. The family also includes several herbs including caraway, angelica and parsley.

Umbelliferous plants have numerous tiny flowers borne on radiating stems like umbrella ribs. They are a decorative family: the foliage of carrots is very attractive and will look good among your ornamental shrubs. Many members of the family are good to eat, although hemlock is poisonous, and very many are eaten by animals. Cow parsley, for example, is well worth gathering for feeding to rabbits.

A feature that all members of the *Umbelliferae* share is that their seed is very slow to germinate. So do not despair if you sow some *Umbelliferae* seed and the plants take ages to show their heads. Just sow a few radish seeds along with the others; the radishes will be up in no time and will show you where the rows of your *Umbelliferae* are.

The members of the *Umbelliferae* family are closely related to all sorts of interesting plants, wild and cultivated, including such exotic things as ginseng, whose ground-up roots are said to "relieve mental exhaustion", and sarsaparilla, which is used to make a soft drink.

## *Carrots*



Like so many valuable food plants the carrot is a biennial, and stores in its first year what it is going to spend in its second in the form of seed. We thwart its aims by gobbling it up in the first year before it has time to grow to maturity. Carrots have been bred to be either long and slow maturing but heavy cropping, or short, stubby and quick maturing but lighter cropping.

The most important constituent of carrots is carotene, which the human body converts to vitamin A. No other vegetable or fruit contains comparable quantities of this vitamin, which, among its other virtues, improves your eyesight; hence the parental exhortation to generations of children: "Finish up your carrots and you will be able to see in the dark."

### Soil and climate

Carrots are a cold climate crop. They can be sown very early in the spring in temperate climates, or in the fall or winter in sub-tropical ones. Carrots prefer to follow a crop that has been manured the previous year. A sandy loam is ideal for them. Heavy clay is not good for them, but if that is the soil you are blessed with you can improve it enormously by copious and constant manuring or composting.

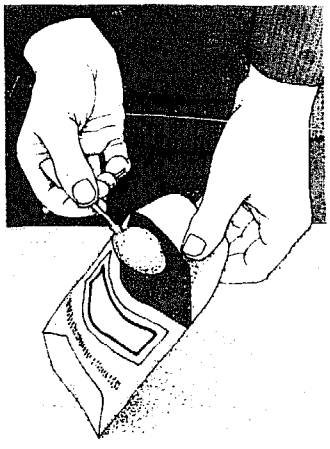
Two buckets of compost and two of leaf-mold applied to every square yard will convert even a heavy clay into suitable soil for carrot-growing. They like a deep soil, particularly the heavy cropping long-rooted main crop varieties.

### Soil treatment

Do not apply fresh manure just before sowing carrots because it makes them tough, watery, and inclined to fork. If the land is acid it should be limed although they will flourish in a pH as low as 6. Like all root crops they like both phosphate and potash; plenty of manure or compost should supply this, but be sure to apply manure at least six months before the carrots are planted. Rock phosphate and wood ashes are also worthwhile. The land should be dug deeply and raked down to a fine tilth.

### Propagation

Draw little furrows about half an inch (1 cm) deep if you live in a moist climate but an inch (2.5 cm) deep in a drier one. Sprinkle the tiny seeds fairly thickly – four or five to an inch (2.5 cm) as some of them don't germinate. With the deep bed method (see p. 106) sow two inches (5 cm) apart each way. Pelleted seed (seed which has been coated with fertilizer so that each seed forms a little pellet) can be used



**DREDGING CARROT SEEDS**
*Since carrot seeds are hardly visible, it is difficult to scatter them sparsely. Coat the seeds by shaking them up in their packet with a spoonful of slaked lime or ground limestone.*

**GERMINATING CARROT SEEDS**
*Carrot seeds need moisture if they are to germinate properly. Two days before planting, encourage them by placing between two sheets of wet blotting paper. But watch for mold.*

to good effect with carrots. Sow it with a precision drill, far more thickly than you think you need to, as germination is even poorer than in conventional sowing. Cover the seed lightly with fine earth or, better still, with fine dry compost. In dry weather soak the furrows well. Don't worry if nothing happens for a bit. Carrots take a long time to come up.

Try interplanting carrots with onions row by row. This is said to deter both carrot and onion fly for the scent of the one conceals the scent of the other.

### Care while growing

You can just leave early carrots as they are in the ground, which will be very overcrowded, and pull them for what gardeners call "bunching". They are tiny like this but they taste very sweet.

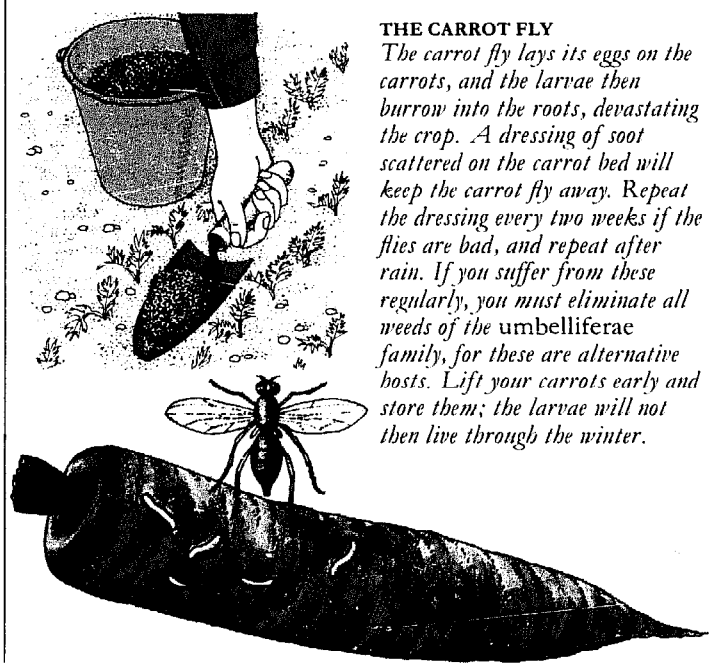
Main crop carrots, which you want for the winter, you will have to thin and here your problems start. For as soon as you bruise a few carrots, and disturb the soil around their roots, you attract the carrot fly which is said to be able to smell a bruised carrot for up to six miles. In areas where carrot fly is very bad it is often best to do your thinning only on a wet day, preferably in light rain. Then, after pulling the thinnings, carefully tread the ground down around the remaining carrots. Thin to an inch and a half (4 cm) between plants first; later on thin to three inches (8 cm) apart. For a deep bed (see p. 106) thin once to two inches (5 cm). You can eat the thinnings.

Don't hoe near carrots. It is not good to loosen the soil and even worse to cut the carrots. You can hoe between the rows but hand weed only in the rows. Try not to let the carrot bed dry out. If you have to water the soil, give it a very thorough soaking; you want the water to go deep down and pull the carrots downward with it. Just watering the surface is no good at all.

### Pests and diseases

***Carrot fly*** Carrot flies lay eggs on carrots; the larvae burrow into the root and spoil the crop. The carrot fly looks much like a small housefly; still it is not the fly itself you are likely to notice, but the leaves of your carrots turning dark red as a result of the damage to the roots. They can be kept away by mixing an ounce (30 cc) of kerosene in a gallon (4.5 l) of water and sprinkling that on, shaking it up well as you do so. Alternatively mix a pint (0.6 l) of kerosene with a bushel of sand and sprinkle that on at the base of the plants. If the carrot flies are bad you may have to repeat the dressing every two weeks, especially if there is a lot of rain. If you have suffered from a very bad attack, dig the bed thoroughly in the late fall, so that birds have a chance of getting at pupae in the soil. In an organic garden you will have lots of beetles, and these may well eat up to half the carrot fly eggs before they hatch.

***Carrot disease*** This can be bad in inorganic gardens but is unlikely to worry the good organic gardener. Brown spots appear on the roots and ultimately tiny red spores come to the surface of the soil; these are the spores of the mycelium which causes the disease. Burn all diseased roots and sprinkle the diseased soil with two parts of sulfur mixed with one part of lime and don't plant carrots there again for at least five years.

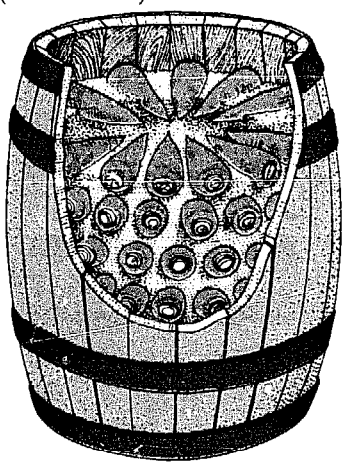


**THE CARROT FLY**
*The carrot fly lays its eggs on the carrots, and the larvae then burrow into the roots, devastating the crop. A dressing of soot scattered on the carrot bed will keep the carrot fly away. Repeat the dressing every two weeks if the flies are bad, and repeat after rain. If you suffer from these regularly, you must eliminate all weeds of the* umbelliferae *family, for these are alternative hosts. Lift your carrots early and store them; the larvae will not then live through the winter.*

### Harvesting and storing

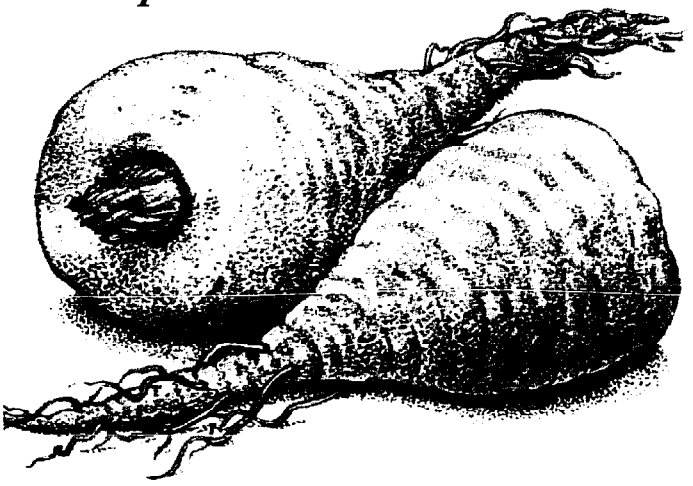
If you pull carrots out of the rows at random you will attract carrot fly. So when you pick early carrots for eating fresh in summer start at one end of the row. Main crop carrots for winter storing can be left in the ground until well into the winter. Where there are very severe frosts lift them before the ground gets too hard and store them, not letting them touch each other, and twisting off the leaves first. Pull your carrots as early as possible if you have had a bad attack of carrot fly. The emerging larvae are then unable to pupate and produce a new generation of flies. If you do leave the carrots in the ground too long in wet weather, the roots are inclined to split; make sure that when you lift the carrots you take care of the roots. Eat any damaged in lifting; don't store them with the others. And remember that if you wash carrots before storing they will inevitably go totally rotten.

Store in a well-ventilated, cool place; just above freezing suits them best. Do not store year after year in the same root cellar because disease will gradually build up. It is best to store them in sand or peat. You can use a variety of containers: a garbage can with plenty of holes knocked in it to let in the air; a wooden crate; a barrel; a dark corner of a cold shed (but beware of rats and mice); or even a box sunk in the ground out of doors, covered with a lid, some straw on top of that and then some earth. If you have a very large number – you can clamp them (see Potatoes).



**STORING THE CARROT CROP**
*When harvesting your carrots, be careful not to damage the roots. If you do, then don't store with undamaged carrots. It is best to store in a cool but well-ventilated place. An old barrel makes a good container. Place the carrots so that they don't touch each other, and build them up in layers of sand or peat. Make sure the barrel is ventilated – drill holes if necessary. Don't store carrots year after year in the same place because you may get a gradual accumulation of disease.*

# *Parsnips*



Parsnips are biennials like all good root crops and are even slower growing than carrots. They are a good crop to grow in dry soil, because they are capable of forcing their food-storing tap-roots two feet (60 cm) down into the soil in their search for water.

### Soil and climate

Parsnips will grow in fairly poor soil; they are so slow growing that they do not need very rich conditions. On the other hand in good soil they will grow better, more quickly and produce more tender roots. And, of course, like every plant they flourish best in soil in which there is a high content of organic matter. They like soil about neutral: pH about 6.5. Very heavy soil is not good for them because it makes them fork. Stones and too much fresh manure also make them fork. A cold climate suits them best: without frost they don't develop their full flavor.

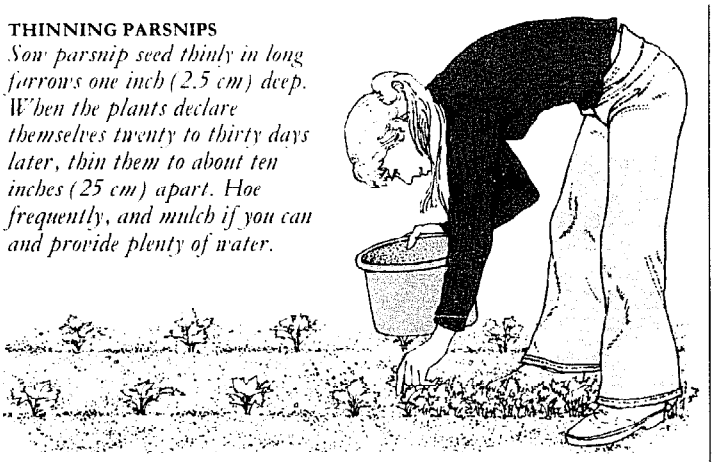
### Soil treatment

The deeper you dig the better; for a really heavy crop dig in very well rotted manure or compost at least 18 inches (45 cm) deep – any less and your parsnips will fork.

### Propagation

Traditionally parsnip seed is the first of the year to be planted outdoors (not counting shallots, which are not a seed anyway). They were, and often still are, sown in late winter – February in New England. However, in common with many other gardeners, I find it better to sow them later – well into the spring. Parsnips sown late are smaller, sweeter and less woody, and they keep better. But, unless your garden really is an old-established organic garden in which the soil is largely humus, you should give late-sown parsnips a dressing of fish meal, bone meal, or some other organic fertilizer high in phosphate (see p. 90).

Again breaking with tradition, I like to sow parsnip seeds sparsely, but continuously, in drills, and thin the plants to about ten inches (25 cm) apart when they grow up. With the parsnip seed I sow radish seed. The radishes grow much more quickly than the parsnips and show you where the rows are so that you can side-hoe (the radishes "declare themselves" as gardeners used to say). The radishes also keep the crust of the soil broken thereby giving the parsnips a better chance, and the leaves of the radishes shelter the young parsnip shoots from the sun.



THINNING PARSNIPS
*Sow parsnip seed thinly in long furrows one inch (2.5 cm) deep. When the plants declare themselves twenty to thirty days later, thin them to about ten inches (25 cm) apart. Hoe frequently, and mulch if you can and provide plenty of water.*

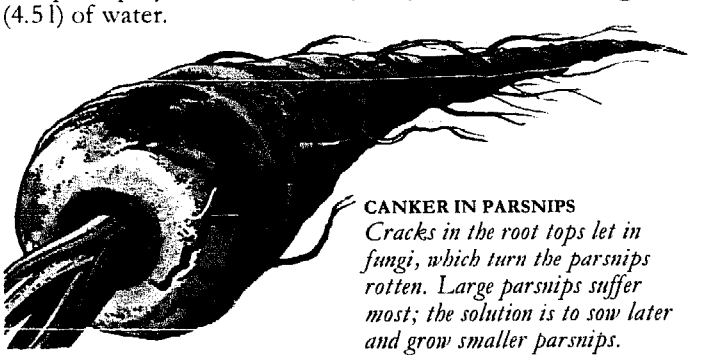
The drills should be about an inch and a half (4 cm) deep. After sowing the seed push the earth back with your foot and walk along the row to firm it. Better still, cover the seed with fine compost and then firm it.

### Care while growing

Young parsnips need plenty of moisture. Hoe from time to time, and mulch with compost if you have it.

### Pests and diseases

***Celery leaf miner*** If you see tunnels mined in the leaves of your parsnips, look for the maggots, which will be living in blisters on the leaves, and squash them. To guard against this pest spray with an ounce (30 cc) of kerosene to a gallon (4.5 l) of water.



CANKER IN PARSNIPS
*Cracks in the root tops let in fungi, which turn the parsnips rotten. Large parsnips suffer most; the solution is to sow later and grow smaller parsnips.*

***Canker*** This is very common. The tops of the parsnip roots go rotten and brown. The worst attacks of canker occur in acid soil and in soil which contains too much fresh manure. So, if your parsnips suffer badly, lime before sowing and refrain from adding fresh manure. A late crop is less likely to get canker than an early one.

***Rust fungus*** This appears as a rusty mold on the crown of parsnip plants. Mix two parts of lime with one part of sulfur and sprinkle this on the soil around the plants. Don't grow parsnips on that bed for at least five years.

### Harvesting and storing

Parsnips are completely frost-hardy but they don't like alternate freezing and thawing, so don't just leave them in the ground until you want them. Dig them up carefully and store in earth, sand or peat in a very cold place. The very best thing is to make a heap outdoors. Do this with alternate layers of earth and parsnips – cover the whole heap with straw as an insulator, and cover this with patted earth to stop the straw blowing away.

# *Celery*

Celery, like parsnips, benefits from frost. In my view it should be eaten only in winter, when it is the most delicious vegetable available. During the rest of the year it is tasteless and insipid, because it has not had the benefit of frost.

### Soil and climate

An organic soil, such as peat or soil rich in humus, is best for celery, and above all it needs constant moisture. It was originally a marsh or streamside plant and it suffers badly if it dries out. A high water table is desirable, but if you don't have that, you need plenty of humus in the soil and you must water frequently if the weather is dry. Celery stands fairly acid soil and does not need lime. Grow it in any climate where there is frost.

### Soil treatment

I like to take out trenches about a foot (30 cm) deep and 15 inches (40 cm) wide, and dig plenty of compost or peat into the bottom. I do this in spring.

### Propagation

Prepare a seed box by filling it with either a compost of three parts sifted loam, one part of leaf-mold and one part of sharp sand, or a proprietary compost. I prefer to do this in late winter but early spring is not too late. After the compost has been well soaked, sow the seeds sparsely and give them a light covering of compost. Place indoors at a temperature of about 60°F (16°C) with either glass or old newspaper over the seed box. If you use glass, wipe off the underside twice a day to prevent moisture dripping on to the seedlings. Keep the plants near the panes of the greenhouse or window so they don't get drawn sideways. Keep the soil just damp at all times; it is best to water with a fine spray, or you can stand the seed box in an inch (2.5 cm) of water and let the seedlings soak it up.

The plants will produce seed leaves before forming true leaves. As soon as the first pair of true leaves has appeared, prick out the plants into another box, which should contain three parts of loam, one part of leaf-mold, and half a part of rotted manure. Alternatively, use store-bought potting compost. Put the plants in carefully, two inches (5 cm) apart, and continue to spray them with water. Gradually harden them off by admitting more air, until late spring when they can be put outside. Never let young celery plants dry out or your sin will be brought home to you months later when they suddenly run to seed before they are ready.

Although mature celery benefits from frost, the young plants will be damaged by it. So don't plant out until you are sure there won't be another frost. Plant out a foot (30 cm) apart, – deep bed method (see p. 106) six inches

**TRENCHING FOR CELERY**
*Dig trenches for celery, a foot (30 cm) deep and 15 inches (38 cm) wide. Tread in three inches (8 cm) of manure, and cover it with three inches (8 cm) of topsoil.*

**PLANTING OUT SEEDLINGS**
*Plant out the seedlings a foot (30 cm) apart in the prepared trenches. Water them regularly until they are established, and continue if there is no rain.*

**EARTHING UP AND TYING**
*In late summer, gather up the celery leaves and stems in a bunch. Tie the tops together; pack soil tightly around the plants, and remove the ties.*

**EARTHING UP AGAIN**
*Two or three weeks after the first earthing up, repeat the process; bank up the soil around the plants until only the leaves are still left showing.*

(15 cm) apart – in the bottom of the trench you have already prepared for them. If you have two or more rows of celery, plant them three feet six inches (105 cm) apart, because when you come to hill them up you will need the space. Sow lettuces, radishes, and other quick-growing catch-crops between the rows. Harvest these before you need the soil to hill up the celery. Keep them well watered, especially for the first two weeks, if there is no rain.

### Care while growing

There are several ways to hill up celery. If you have no help, tie the tops of the plants together, and pack the earth around the plants as tightly as you can, but without getting too much earth inside them. Fill the trench level in this way, then remove the ties on the tops of the plants. This should be done in late summer. Two or three weeks later hill up again, using more lime to thwart slugs, and bank the soil well up around the plants. A further hilling up may be necessary in another few weeks. If you have enough peat, use it in the later hillings up but lay slates or planks on the slopes of the bank to stop it washing or blowing away.

The purpose of all this hilling up is to keep the stalks away from the light. Like potatoes they become bitter as they turn green from exposure to light, so the higher you keep them hilled up the more crisp white celery you will have to eat. You can wrap the celery in collars of paper or plastic sheet before it is hilled up to prevent soil getting inside the plants, but this method attracts earthworms and slugs.

### Pests and diseases

***Leaf miner*** This is very common. It occurs when the maggots of the celery fly begin to mine tunnels into the leaves of the celery plant. Pick off any affected leaves and burn them. To control the disease, spray liquid manure over the plants once a week. The smell deters the flies from laying their eggs.

***Leaf spot*** Also known as "celery blight", leaf spot can destroy your celery if it is not quickly checked. The disease, which is spread through the seeds, will cause small yellowish brown spots to appear on the leaves. Spray immediately with fungicide or the whole plant will become affected. Next year dip your seeds in formalin before sowing them.

***Damping-off disease*** Young celery plants will suffer damping-off if they get too much water or too little air. The main symptom is a watery soft rot. Wipe off condensation if you're growing seedlings under glass, and make sure the seedlings are properly aired.

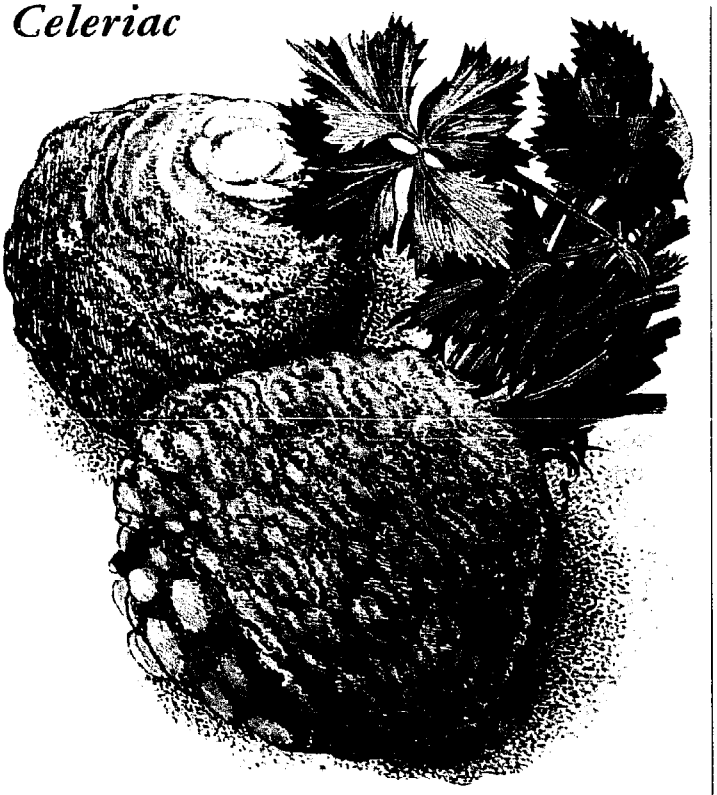
### Harvesting and storing

Pull celery whenever you want to eat it, and if you are interested in flavor do not start eating it until there has been a frost. Thereafter try to make it last until well into the winter. It is a very good idea to protect part of a row with cloches as soon as the really heavy frosts set in. This will keep the celery good until late in the winter. (So as not to waste cloche space, plant a double row of celery in the same trench.) If you haven't got cloches you can use straw or bracken at night, but take it off on warmer days.

## SELF-BLANCHING CELERY

To my taste, self-blanching celery is not as good as celery, but it is easier to grow. You raise it from seed in the same way as celery, plant it on the flat in late spring or early summer, and it is ready to eat in late summer. It won't stand frost at all.

## *Celeriac*



The most delicious part of a stick of celery, in my opinion, is the crunchy base – the heart, as it were, of the celery. With celeriac you grow all "heart" and no stem. It tastes like a combination of celery and parsley. It can be eaten raw, but is usually boiled and added to soups or stews. Grow it exactly as you grow celery.

### Soil and climate

Celeriac needs rich and mellow soil which has been well-manured. It grows best in a cool, moist climate.

### Soil treatment

The deep bed method (see p. 106) is ideal for celeriac, but, whether you use it or not, dig deeply and incorporate plenty of manure or compost.

### Propagation

Sow indoors in late winter or outdoors in a nursery bed at the beginning of spring. Plant out in early summer.

### Care while growing

Celeriac should be watered frequently and kept free from weeds. When you hoe draw soil away from the plants. Don't hill up as you would for celery.

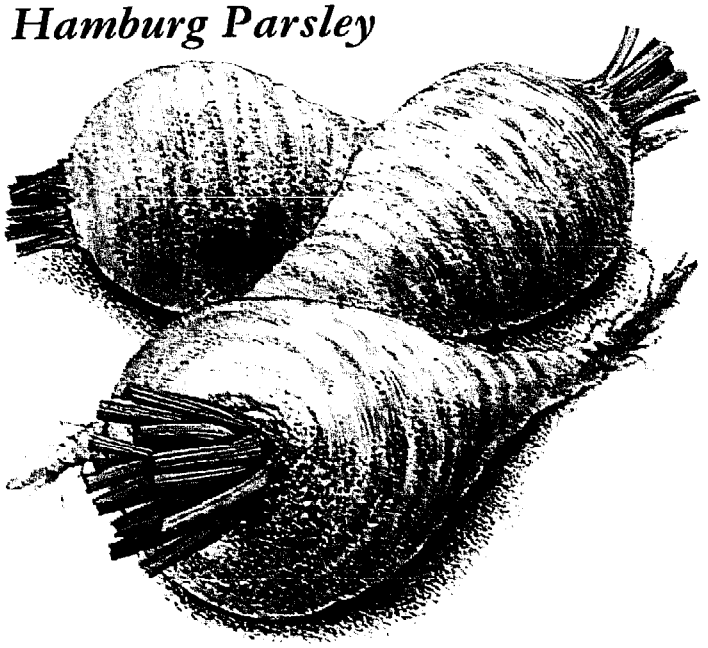
### Pests and diseases

***Celery leaf miner*** Like celery, celeriac can be attacked by leaf miner though usually to a lesser degree. Simply pick off affected leaves or spray the plants with liquid manure.

### Harvesting and storing

You can begin to harvest in the late fall. In a very cold climate store celeriac in a root cellar, but if your winters are temperate leave them in the ground and harvest them as you want them.

# *Hamburg Parsley*



Hamburg parsley or "parsnip-rooted" parsley grows as a root vegetable and can therefore be stored. It is not just an herb for flavoring things, although the leaves taste very like ordinary parsley and can be used as such; the roots can be eaten raw or cooked like parsnips, which they resemble.

### Soil and climate

You can get a good crop wherever ordinary parsley will grow, namely in temperate climates. The more sun the plants get, the better.

### Soil treatment

Hamburg parsley tolerates poorer soil than most root crops, but dig deeply and work in plenty of well-rotted manure.

### Propagation

Like all the *Umbelliferae* the seed takes a long time to germinate. Soak the seed before planting and sow sparsely in drills either in the fall or early spring. A dressing of a high phosphate fertilizer such as fish meal or bone meal is useful.

### Care while growing

When the plants come up, you should thin them out to about four inches (10 cm) apart, either in the rows or the deep bed (see p. 106). Hoe the plants. They don't need to be watered much unless it is a particularly dry summer.

### Pests and diseases

***Canker*** It is possible that the canker which can attack ordinary parsley may also attack Hamburg parsley. It gives a rusty appearance to the stems and causes the roots to decay. To prevent it, do not water too much. If you do get it, burn all your diseased plants.

### Harvesting and storing

The leaves can be picked off and used as an herb, but the roots should be pulled as late as possible, because – and this is unusual – the largest roots taste the best. But don't leave the plant in the ground after the first frost. Store it in peat or sand, in crates or garbage cans in a root cellar, basement or other similar cold storeroom.

# *Florence Fennel*

Unlike ordinary fennel, which is used only as an herb (see p. 196), Florence fennel can be eaten on its own because the leaf-stalks swell at the base of the leaves to form large bulbs. Sliced raw, these can be added to salads. The stems can be eaten raw like celery, and leaves and seeds can be used for flavoring. It is well worth growing for its unique taste which combines the flavors of aniseed and licorice.

### Soil and climate

Florence fennel will grow as a perennial only in hot climates, but it can be grown as an annual nearly anywhere. If you want really tender and delicious stems grow it in the richest ground you have.

### Soil treatment

Prepare the ground as for celery, digging deeply and incorporating a lot of manure.

### Propagation

Sow seeds thinly in shallow drills either in the late fall, or early spring.

### Care while growing

Florence fennel needs very little attention. Thin to six inches (15 cm) apart in the rows or deep beds (see p. 106) and water when required. It is worth hilling up the bulbs to blanch them and to help the plants retain moisture.

### Pests and diseases

Florence fennel is happily disease-free, as well as also being highly resistant to pests.

### Harvesting

Cut the heads when they are about two inches (5 cm) across. The stems above them should be harvested before they get too old and stringy and stripped of their outer skin.

# *Liliaceae*

*Onions, leeks and asparagus* are all members of the *Liliaceae*, or lily family.

As I have discussed elsewhere (see p. 19) the main subdivisions of the plants which provide us with nearly all our food are the two great classes: the monocotyledons (monocots for short) and the dicotyledons (dicots for short). Most of our vegetables are dicots. That is, they have two seed leaves – the first leaves they make – while the monocots have one. But the important difference between the two classes is nothing so trivial: it is that they have entirely different ways of growing. The dicots grow outward from the edges of their leaves. The monocots grow from the bases of their leaves thus pushing their leaves up and out from the bottom.

The members of the lily family are monocots, as you can easily see by looking at their leaves. These don't have the network of veins that dicots have, but instead have parallel veins – each vein starting at the base of the leaf. Onions and leeks make use of this particular form of leaf growth to store nourishment in hard swollen bulbs, which are nothing more than many leaf bases compressed together to form a bulb. Asparagus is not so instantly recognizable as a monocot, but it is one nonetheless. The shoots, which are the edible part, grow from a "rhizome"– a horizontal stem which remains underground. The attractive fern-like branches which sprout as the shoots grow taller are like leaves and these grow up from their bases like the leaves of the other monocots. The rhizome takes nourishment from the leaves in one year and uses it to produce the next year's shoots.

Humans and many other animals have always made use of plants that form bulbs in their first year as a convenient way of storing the energy they will use to produce flowers and fruit in their second year. Although we don't eat lily bulbs we do eat onions, leeks and asparagus.

## *Onions*

### COMMON ONIONS

With careful growing, harvesting and storing, there should be no part of the year in which your kitchen lacks that most indispensable ingredient, the onion. But you may well feel confused by the amount of conflicting advice that is available. Onions have been grown for centuries, and it sometimes seems as if each grower has his own special technique. In fact the right timing and method depend largely on where you live.

#### Soil and climate

Onions need good rich soil. Sandy loam, peat and silt are all fine, but onions don't like clay, sand or gravel. They grow successfully in widely different climates, although they prefer cool weather while their leaves are growing and developing followed by very much hotter weather while they make their bulbs.

#### Soil treatment

Onions have very shallow roots and grow quickly so they need plenty of nourishment in the top four inches (10 cm) of soil. Prepare the bed well the previous fall with well-rotted manure or, even better, with a large amount of thoroughly rotted compost. They like plenty of potash and phosphate but not too much nitrogen. It is useful to add any of the following to your soil: wood ash, ground rock phosphate, soot, seaweed meal, a sprinkling of salt. The soil should have a pH of 6. If it is lower, add lime.

Before planting out, firm the ground by treading or rolling – preferably both. And the soil must be dry, whether you are sowing seed or transplanting.

#### Propagation

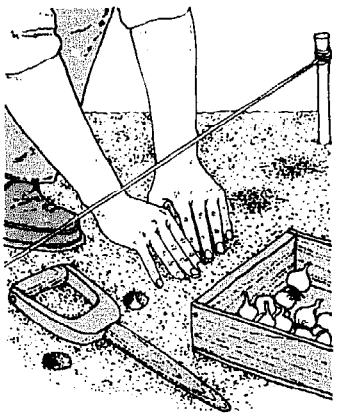
If your neighbor is a successful onion-grower, it's a good idea to ask him for advice. There are four possibilities.

***Late summer sowing*** The idea of this is to get the onions to form bulbs by the early spring, before hotter weather causes them to bolt, and then allow them to mature through the summer. Sow the seed thinly in shallow drills, cover with half an inch (1.5 cm) of compost and firm the ground. If the winter is particularly hard, put cloches out during the worst of it. In the spring, thin out the onions to about six inches (15 cm) apart. The thinnings can be used in salad.

***Winter sowing*** In very frosty areas, it is best to sow onion seeds indoors in midwinter, for planting out in the spring as soon as the ground is dry enough. Sow seed thinly in seed boxes filled with either a proprietary compost or a mixture of three parts sifted loam, one part leaf-mold, one part fine compost and a sprinkling sand. Keep moist but not wet, and cover with glass or paper. When the seedlings show, remove the covering and keep the seed box at about 65°F (19°C) near a window. When the second leaf is about half an inch (1.5 cm) long prick the seedlings out into another box so that each plant is two inches (5 cm) away from the next. Use the same mixture of compost for the pricking-out box, but add one part of well-rotted manure. Harden the plants off gradually until they are in the open air, in a sheltered place by the last frost. Plant the seedlings

out in the spring. It is best to leave their permanent bed rough until the last moment so the soil can dry out. Before planting, rake it down as fine as powder and tread firmly.

***Spring sowing*** This is only good where there are cool damp summers, and you won't be able to store the bulbs. Sow out of doors as you would onions sown in late summer and thin them out to four inches (10 cm) apart when they are big enough for the thinnings to be used as salad onions.

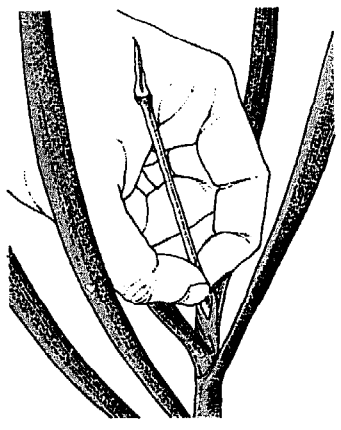


**PLANTING ONION SETS**
*To grow onions from sets it is essential to press the soil very firmly around each set. Make holes six inches (15 cm) apart; press the sets into the holes. Contrary to the usual advice (which is to leave the tops just showing), I suggest that you bury the sets completely, so that they are out of the reach of birds.*

***Onion sets*** If you prefer them to seed, onion sets grow best in temperate climates where they should be planted in the spring. Make dibber holes every six inches (15 cm) – deep bed method four inches (10 cm) – along a line and push the sets into them, pressing down the soil around each set to hold it firm. I bury the sets completely—so that the top-knot is just below the surface where the birds can't pull it out.

### Care while growing

The most important thing is to keep your onions well weeded. In their later stages they benefit from a mulch and this can be done with uprooted weeds. If your onions flower, pinch out the stems while they are still small.



**PICKING OUT FLOWER STEMS**
*If necessary pinch out the flower stems while they are still quite small. If you don't do this, the plants will "bolt", that is to say, they will produce flower heads. These in turn prevent the bulbs forming properly. When you are picking out the flower stems, take care not to loosen the bulbs.*

### Pests and diseases

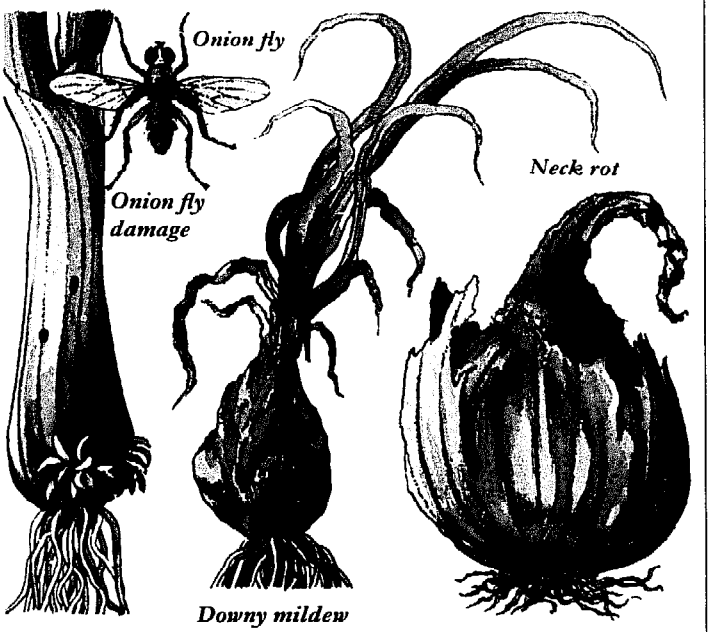
***Onion fly*** The maggots of the onion fly are one of the nastiest pests we have to suffer as they can stop onions growing altogether. The maggots eat into the bulbs of seedlings. Spring-sown onions are the worst hit, but onions grown from sets aren't likely to be affected. To deter onion flies and their maggots dust your rows of onions with flowers of sulfur, or sprinkle with an ounce of kerosene to a gallon of water. Dust fairly regularly, particularly when you thin the plants.

***Downy mildew*** This occurs particularly during wet seasons, and causes grayish or purple streaks on leaves. If you find it, dust with Bordeaux powder (see p. 100).

***Eel worm*** These microscopic worms will cause the tops of your onions to wilt. Burn all affected plants and don't grow onions or allow chickweed, which also harbors them, to grow on that land for six years.

***Neck rot*** This disease attacks onions in storage. A gray mold forms on the onion skins and later the centers turn brown. Prevent it by drying your onions off well after harvesting and storing in a cool airy place.

***Onion smut*** Onion smut shows as black blisters on stems and bulbs. If you get it in your garden, water the rows with a solution made from a pint (0.5 l) of formalin and four gallons (18 l) of water when you sow. But you are unlikely to get this.



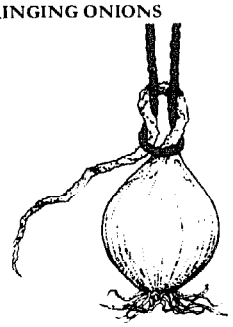

### Harvesting and storing

It is well worth bending over the tops of your onions when they will grow no more. This will start them ripening. In a hot dry autumn, ease the onions out of the ground and leave them a week or two in the sun to dry. But don't damage the skin or you'll let in neck rot. In wet places, lay the onions on wire netting after harvesting – an old spring bed would do – in order to keep them off the ground. But put them under cover if it's rainy.

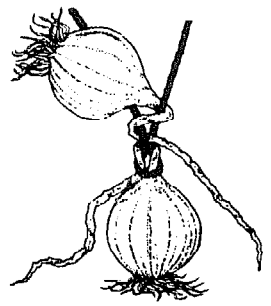
**BENDING THE TOPS**
*When the tips of the leaves start going yellow, it is time to bend over and break the necks of the onions. This starts the ripening process. At the same time loosen the onions with a fork to start them drying, but take care not to damage the skins. A few days later ease them out of the ground and leave them in the sun to finish drying out.*

It is vital to dry onions well. When they have dried, the best thing to do is string them. Otherwise, put them in layers in some cool, airy place. They must not suffer severe frost, but it is better for them to be cool than hot. If you hang a string by your stove use them fast before they rot.

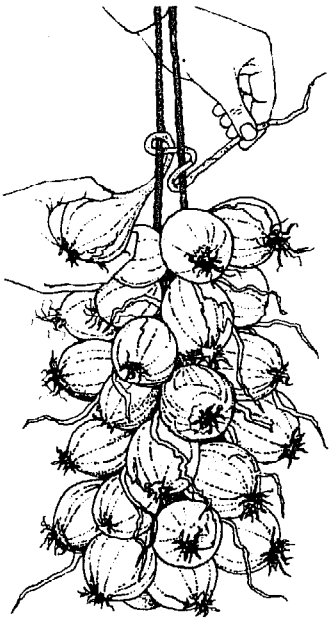
**STRINGING ONIONS**



1 *Knot together the ends of a three foot (90 cm) length of string and hang the loop from a hook. Weave the first onion through the loop.*



2 *Use the leaves of the second onion to weave in and out of the string. The weaving must be tight and the second onion should finally rest on the first.*



3 *One by one add onions to the original two, weaving first from the left then from the right. As the bunch grows, check to make sure it is well balanced. When you finish, hang up the string in a cool, dry airy place and the onions should keep until early summer. Remember that all onions for stringing need long, dry leaves.*

## SPRING ONIONS

To fill the gap after the last of your stored onions have gone rotten – if you haven't planted spring onions specially – buy bunches of spring onions and plant them out three inches (8 cm) apart. They will quickly produce small bulbs. Alternatively, sow any onion seed, or the special spring onion varieties in late summer, and pull them in the spring. But, of course, if you have sown onions out of doors in late summer, you will have spring onions anyway as a result of thinning them.

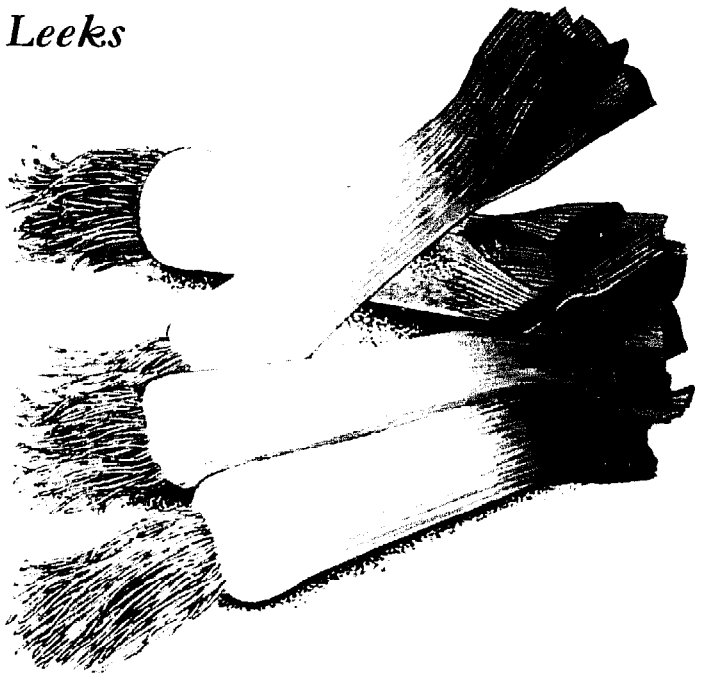
## SCALLIONS

Any onion can be harvested young and used as scallions or green bunching onions, but there are special bulbless bunching varieties that are bred for this purpose. These produce clusters of long, slender white stalks but do not form bulbs.

## SHALLOTS

The mild but distinctive flavor of shallots is essential to French cooking. Shallots are expensive, so it is worth growing your own. Plant them any time before early spring. Prepare the ground in the same way as for onions, and plant the shallots as you would onion sets, about six inches (15 cm) apart. When you harvest, store them in a string bag.

# *Leeks*



The leek is sometimes rightly called "the gourmet's onion". The Welsh, recognising its fine qualities, have made it their national emblem, and have created a superb leek soup named "cawl". If you wish to grow only one vegetable of the *Liliaceae* family, begin with the leek. It will not let you down.

During the dreary hungry gap when all else fails, which stretches from late winter through to the middle of spring, the stalwart leek is there to relieve you from a diet of salted this and frozen that.

### Soil and climate

Leeks like a rich loam, but they can, and often do, put up with practically anything. Still, for leeks that you can be proud of, give them plenty of manure and plenty of compost. They need a moist but well-drained soil, and they like a high pH – between 6 and 8. They are temperate climate plants but will grow in any climate except a tropical one. In my view, though, leeks grown in dry weather don't seem to have the flavor of those grown under cloudy skies.

### Soil treatment

For really fine leeks, treat your soil as you would for onions (see Onions). It is common to follow early potatoes with leeks – forming a part of the legume plot in our recommended rotation (although they are not of course legumes). In this case the heavy manuring the potatoes have had will be perfect, though the leeks will probably want some lime.

However, I generally plant leeks with the brassica because they are then sharing the only bed that does not need digging up until late the following spring. While leeks are very closely related to onions they do not fit easily into the onion bed, for the onions are strung and hung up in a cool shed before we even start to eat the leeks.

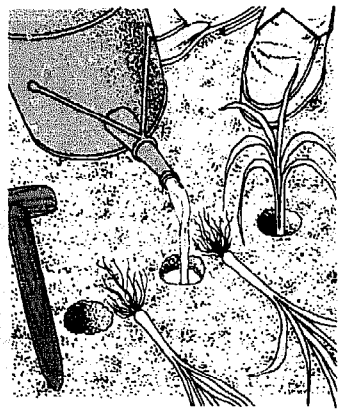
In hard ground trench for leeks, digging one spade depth deep and mixing in plenty of compost or well-rotted manure.

### Propagation

In very cold climates, sow seed indoors in late winter and keep them at about 60°F (16°C). For summer leeks you should do this anyway, but I think it a pity to eat leeks in

the summer – "the fruits of the earth in their season" is what suited Adam and Eve before they tasted of the wrong fruit – and it is nice to come to leeks around Christmas with an unjaded palate. For winter leeks, in all but the coldest climates sow fairly thickly along the drills in the *brassica* seed-bed in early spring. Do not throw the left-over seeds away after sowing; each quarter ounce (7 g) holds about a thousand seeds, and they keep for around four years. Plant out in the garden when they are four inches (10 cm) high.

It is common advice to snip an inch off the tops of the plants and at the same time snip the roots to about half their length. Then simply drop each plant into a hole made with a dibber and pour a little water in. This works perfectly well but, since I prefer not to mutilate plants more than I have to, I plant them as I do cabbages. Simply make a hole with your dibber, pour a little water in, and push the unmutilated leek down into the mud. I suggest you try half a row each way and see which grows better. Plant them six inches (15 cm) apart – deep bed method four inches (10 cm) (see p. 106) – in rows wide enough to work between – say 16 inches (40 cm).



PLANTING LEEKS
*Using a long dibber, make holes eight inches (20 cm) deep and six inches (15 cm) apart, in rows wide enough apart to allow space for maneuvering – say 16 inches (40 cm). Pour a little water into each hole, push the leeks down into the mud, roots first. To snip an inch off the top and the longer roots beforehand is a matter of personal preference.*

### Care while growing

Never let leeks go short of water. Hoe them and mulch if you can. Earth them up every now and then as they grow, in order to blanch them.

#### Pests and diseases

Leeks are said to suffer from all the same pests and diseases as onions, but I have never known a leek to suffer from anything – except somebody digging it out of the ground and eating it.

### Harvesting and storing

When digging up leeks, avoid cutting off too much of the foliage; the leeks' prime food value consists of the vitamin A to be found in the leaves. So, as well as eating the stems, try and make use of the leaves, in soups and so on: they taste very savory.

In freezing climates leeks can be dug up before the first severe frost and heeled into earth in a cellar. In less severe climates they should be hilled up nearly to the tops of the plants. In temperate climates, leave them in the ground if possible until at least Christmas, and spare them even after that until late winter when the Brussels sprouts begin to look a sorry sight and you are tired of broccoli and kale. Then dig them up as you need them. However, if you wish to clear the bed for something else, it is perfectly all right to dig all your leeks up and heel them into the ground in a short row out of the way and near the kitchen.

## *Asparagus*

Asparagus is an excellent vegetable to grow, for it gives you a fresh bite of green-stuff in the spring. It can be cut and cut again for a period of six to eight weeks, and it is impossible to conceive of anyone ever getting tired of so exquisite a taste. If you care for your asparagus bed properly, it will go on producing for anything between ten and forty years. On the other hand, an asparagus bed takes up a lot of space, especially since you have to wait for three years from the time of sowing for your first taste.

### Soil and climate

Asparagus came from the seaside and can put up with salt. It likes a mild, moist summer and a cold enough winter to make it go to sleep for half the year. Only a very severe frost will harm it after it has died down for the winter, but it is a good idea to cover the bed with straw if the winter is frosty. The plant flourishes in a light, well-drained loam and it will grow well in sandy land if it has been well-manured and composted and is not allowed to dry out. The soil should have a pH of 6.5, which may mean you have to add lime. It is possible to create soil suited to asparagus artificially – heavy clay, for instance, can be properly modified by adding plenty of compost and sand – and it is well worth doing this, as asparagus is a perennial and will go on feeding you for years.

### Soil treatment

The bed must be entirely free from perennial weeds, because once the roots of these are thoroughly intertwined with the roots of the asparagus, which spread out as far as five feet (1.5 m) you will never get them free. So the fall before you intend to plant, fork the planned bed over and over again and remove every last inch of couch grass root, ground elder, or convolvulus.

Then, if your land needs it, fork in lime and also if necessary rock phosphate or wood ash or some other form of potash, but if you have enough compost you needn't bother with this. Half a pound (200 g) of fish meal and half a pound (200 g) of ash per square yard is a good insurance.

The old-fashioned method of preparing the bed, and one which I think can't be beaten, was to take out a trench five feet (1.5 m) wide and one foot (30 cm) deep, placing the top soil to one side separately. Put six inches (15 cm) of good stable manure in the trench, six inches (15 cm) of rotted turf on top of this, and another few inches of well-rotted manure

or compost. Replace the topsoil on this and you will have a bed for three rows of plants. An alternative is just to dig plenty of manure or compost into the soil in the fall and plant in that, in either single rows or rows about four and a half feet (1.4 m) apart.

### Propagation

Asparagus can be grown from seed. Collect your own seed by hanging some of the female ferns up when they are quite ripe, letting them dry, and then rubbing the seed out with your fingers. But if you grow them from seed you won't get any asparagus to eat for three years. If you can't wait that long, buy two or three-year-old crowns from a nursery. Even one-year-old crowns save you some waiting time, they are cheaper than older plants and transplant more easily.

If you are sowing seed, either do it indoors in seed boxes or outdoors in a seed-bed, sowing in early spring and later thinning to three inches (8 cm) apart.

Whichever method you choose, when the plants are ready for their final bedding out, take out a trench or trenches nine inches (25 cm) deep and a foot (30 cm) wide, make a cushion of fine soil in the bottom, slightly convex in section, and lay the plants on that, two feet (60 cm) apart in the rows – deep bed method 12 inches (30 cm) apart (see p. 106). Never let asparagus crowns dry out. If you buy the crowns from a nursery, keep them moist right up to the time you put them in the ground and then give them a good soaking. Cover immediately with fine earth and compost.

### Care while growing

Asparagus benefits enormously from heavy mulching. I like to mulch with seaweed, but otherwise mulch with any organic material which is non-acid – don't for instance use pine needles or oak leaf-mold unless you mix thoroughly with lime first. If you use sawdust or anything very hard to break down, put some high nitrogen material on, like blood meal. Don't hoe too deeply or you'll damage the asparagus roots. Your mulch is the best weed suppressor.

Many people cut the ferns down in the fall as soon as they turn yellow, but I prefer to leave them to die down naturally and return their goodness to the plants.

### Pests and diseases

***Asparagus beetle*** Use your fingers to pick off any beetles which appear on the asparagus shoots and kill them. Do it early in the morning when the beetles can't fly. Otherwise dust with derris powder when the dew is on them.

***Asparagus rust*** If you live in a very humid area your asparagus may be affected by this fungus, so plant a rust-free variety. If you still get it, spray with Bordeaux mixture.

### Harvesting and storing

Don't touch the plants for three years if you grew them from seed, or for two years if they grew from roots. Then cut the shoots before they begin to open as you want them. Cut for six weeks after they begin to shoot the first year, and thereafter for two months. The middle of June is the latest you should let yourself cut asparagus. From a five-year-old bed sporting two healthy plants, you will probably find that you can cut enough asparagus for one person to have one helping a week throughout the cutting season.

To avoid a dearth of asparagus reckon on ten years as the lifetime of a bed, and then plant a new one. A good tip, when you scrap an old bed, is to take the plants out carefully at the end of the fall and plant them in a hot-bed. You'll benefit by getting asparagus a month earlier than usual.

Asparagus can be canned or frozen (see p. 220 and 227). My personal prejudice is against doing either because the great pleasure of eating fresh asparagus in the spring – surely one of the heights of gastronomic experience – is lost if the palate is jaded by having munched away at canned or frozen stuff the rest of the year

**TRENCHING FOR ASPARAGUS**
*Dig a trench nine inches (25 cm) deep and a foot (30 cm) wide. Leave the bottom slightly convex, so that it will hold water, and cover it with a layer of fine soil.*

**PLANTING THE CROWNS**
*Set out the plants on the layer of fine soil, two feet (60 cm) apart. Lay them with the roots spread out carefully to absorb all available moisture.*

**MULCHING THE PLANTS**
*Seaweed or fish meal is ideal for heavy mulching; otherwise use any non-acid organic material. When the ferns turn yellow in fall, let them die naturally.*

**HARVESTING THE CROP**
*Three years from sowing or two from planting is the time to harvest. Cut the shoots for not more than six weeks the first year, and two months subsequently.*

# *Chenopodiaceae*

*Beet, spinach, Swiss chard or seakale beet and spinach beet* are the edible members of the *Chenopodiaceae*. This very distinctive family originally came from the seashore, and the members of it share with the cabbage tribe the characteristic that their leaves have a tough, cutinous surface which is designed to limit transpiration (the escape of water from the plant) and thus preserve the moisture which the plants win so precariously from their salty surroundings. Seashore plants share with desert plants the need to conserve moisture, for their salty environment tends to draw it out of them by osmosis. The beet family also has the peculiarity of producing its seed in little fruits that remain intact until they germinate in the ground. What we plant as the "seed" of beet and spinach is in fact a small fruit containing four or five seeds, each of which grows into a plant. Thus you find that when you plant these fruits you get plants coming up in clusters. The clusters should be thinned to leave one plant from each for the best beet or spinach.

The family includes sugar beet, which is grown for sugar of course (the roots can be up to 21 per cent sugar), and mangels, or "cattle-beet", which are grown specifically for feeding to cattle and making into sugar. The beet family are characterized by the fact that the swollen roots that we grow them for display rings when you cut them across. These rings are alternately storage tissue and conveying tissue. It is the storage tissue that contains the nutrients which the beet stores up in its first summer, so that it can leap ahead quickly in its second summer and produce seed before it dies. The conveying tissue transfers the nutrients from the roots to the rest of the plant.

Beet and spinach can send their roots down ten feet (3 m) or more into the soil. They also occupy the soil very fully, filling it with a mass of fibrous rootlets. This has a good effect, breaking up the soil and loosening it, so when the roots rot they leave passages for water and air far down into the subsoil.

It is possible now to get fragmented seed of the *Chenopodiaceae* – where the fruitlets have been broken – or to get pelleted seed. Each of these makes it possible to sow singly, either by hand or with a precision drill, which saves thinning later. But the expense is really only justified if you are growing on a large scale.

## *Beet*

The western culinary imagination never seems to get much beyond boiling beet for many hours and then soaking it in vinegar. But we have only to look to Russia and to the delicious borsch to see just what can be done with this sadly under-used vegetable.

### Soil and climate

Beet is really a cold climate plant; in hot countries it must be grown in the winter, early spring or fall. It likes well-drained soil, with plenty of humus, but not fresh manure. It won't grow at all if the ground is too acid, and needs a pH of about 6.5.

### Soil treatment

In my suggested four-course rotation, beet should be grown in the root plot. The land should by then have been heavily manured three years before for the potatoes, limed two years before for the *Leguminosae*, and probably well-mulched with compost one year before for the *brassica*. The soil should be well dug and without too many stones.

### Propagation

The main crop of beet for storing should be sown about three weeks before the date of your usual last frost. But you can go on sowing successionally until midsummer. It's worthwhile soaking the seed a day or two before sowing. Sow the seed thinly three-quarters of an inch (2 cm) deep in drills a foot (30 cm) apart. When the plants appear, first single each cluster, then thin out to three inches (8 cm) apart for small beet and nine inches (25 cm) apart for large beet for winter storing – deep bed method (see p. 106) four inches apart (10 cm). You can eat the baby thinnings.

### Care while growing

Hoe several times to suppress weeds until the shiny leaves of the beet start doing the work themselves. Beet grown in dry conditions become hard and woody and they can often bolt. Mulching and watering should prevent this.

### Pests and diseases

***Leaf miner*** The larvae of the beet fly will bore through the leaves. Pull off the affected leaves and burn them.

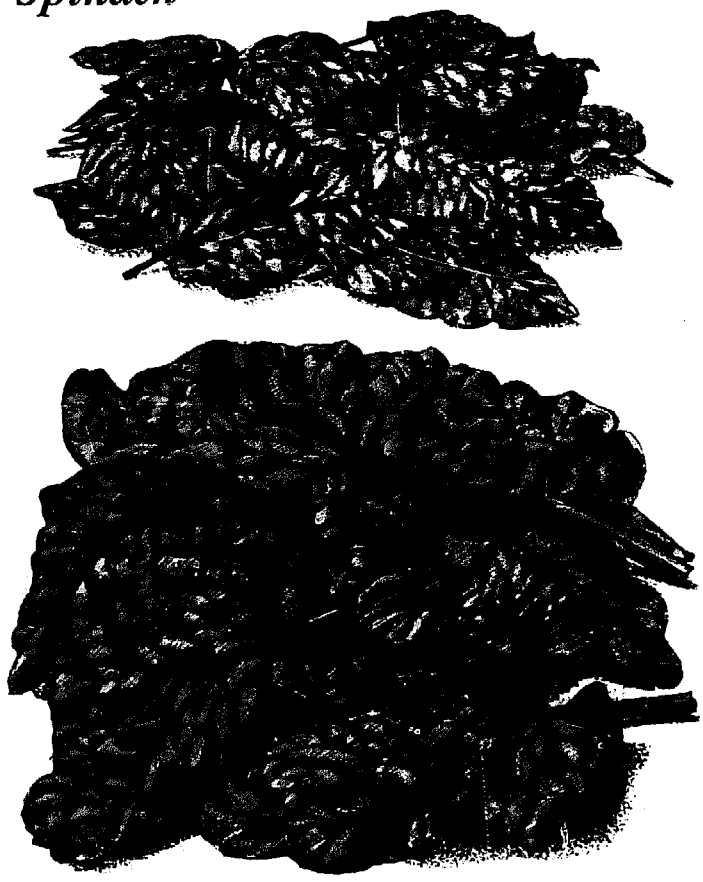
***Beet beetle*** Beet may become infested with tiny black beetles. Water the plants with nicotine water.

### Harvesting and storing

The tops of beet can be eaten as well as the roots but, if you're going to store beet, wring the tops off – don't cut them since it makes them bleed. And avoid bruising.

By far the best way to store beet is to lay them gently in peat – or moist sand – without allowing them to touch each other. If you lay them in the open they will shrivel up.

# *Spinach*



Of all the popular vegetables spinach contains the most vitamin C, iron and calcium. You can have it all year round with careful planning. It is a cool weather crop and will even grow in Alaska's colder zones. In hot climates or even in more temperate ones, New Zealand spinach, (which belongs to the *Tetragoniaceae* family) is a good substitute and can be grown in the summer.

### Soil and climate

High temperatures during the first couple of months of its growth will cause spinach to bolt to seed, so it is really a winter crop in hot climates. It likes good rich loam, and should be kept damp, but it will grow in most soils if there is enough organic matter present. It isn't a good idea to plant in soil where fresh manure has recently been applied.

### Soil treatment

Spinach will go in odd corners as a catch crop, but it doesn't like an acid soil, so lime if necessary to bring the pH to between 6 and 6.5. If the soil is over 6.7 then spinach will be one of the first plants to show manganese deficiency, since manganese gets locked up by too much lime. The ground should be well dug; alternatively, use a good layer of compost.

### Propagation

In cool climates, the prickly-seeded variety of spinach is best in the winter and the smooth-seeded variety in summer. In hot climates the smooth-seeded variety should be planted in winter. Even in pretty cold climates you can sow smooth-seeded spinach in winter (though not of course where the ground is frozen) and successionally thereafter – say once a month – until late summer. In wet winters it is a good idea to sow spinach on raised ridges for better drainage. In spring and summer, sow on the flat. Sow three-quarters of an inch (2 cm) deep and, when the plants declare themselves, thin to four inches (10 cm) in rows a foot (30 cm) apart. Allow three inches (8 cm) in both directions between thinned plants in the deep bed (see p. 106), and take care not to step on the bed when thinning.

### Care while growing

Hoe and mulch if you can to keep down weeds. Water only if the weather is very dry; if the soil is allowed to dry out the plants will bolt.

### Pests and diseases

***Mold*** Spinach is virtually free from pests and diseases in good organic gardens, but in muggy, damp weather it can get moldy. This mold manifests itself as yellow patches on the leaves and grey mold on their undersides. If it appears, the best thing to do is scrap it and plant some more. If you plant some every month (a short row of course), you won't have to go long without it. If it bolts, then the only place for it is the compost heap.

### Harvesting

Simply pluck the leaves from your spinach as you need them. In fact, if you want the plant to go on bearing you should pluck the outer leaves fairly often. Spinach tastes best if you simply rinse it quickly and put it, still wet, straight into a pan with a close-fitting lid. Don't add any more water; just leave it to simmer for five minutes or so.

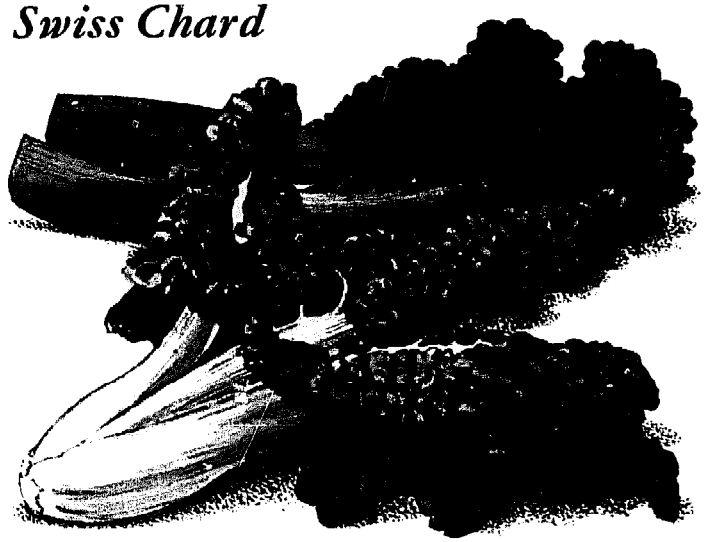
**HARVESTING SPINACH**
*You need a lot of spinach before you have enough for one helping. The secret is to have sown enough plants: as long as you spread the plucking over several plants, the more often you pluck the leaves the better. Pick young leaves from the outside, taking care not to denude any one plant.*

## NEW ZEALAND SPINACH

New Zealand spinach is not in fact a member of the *Chenopodiaceae* family but it is similar enough to warrant talking about here. New Zealand spinach doesn't have the high oxalic content of true spinach, so its nutritional value is more available. It is less frost-hardy than true spinach and it should be grown in the summer. In very hot climates it will stand up to heat far better than ordinary spinach, but it does need protection from the sun.

Don't sow until all danger of frost is past. Grow New Zealand spinach in rows four feet (1.2 m) apart in good soil, or closer together in poor soils. When sown directly into a deep bed, it will grow particularly well. Soak the seeds in water for twenty-four hours before sowing; otherwise their hard cases make them slow to germinate. Plant three seeds in each position and later pull out the two weaker plants. Otherwise treat New Zealand spinach just as you would treat true spinach.

## *Swiss Chard*



Swiss chard or seakale beet is just a beetless beet, as it were: it's a beet which puts down deep narrow roots instead of making one swollen root. It is an excellent crop for your garden since it sends its tough roots three feet (90 cm) down into the subsoil and draws up what is good down there. Both the leaves and the midribs of the leaves can be eaten; you should cut the midribs up before cooking them, and they need cooking longer than the leaves.

### Soil and climate

Swiss chard will grow in most climates except the very hottest and in any soil which is not waterlogged.

### Soil treatment

Swiss chard, like the other beet crops, needs a pH of about 6.5, so lime if necessary. A small amount of well-rotted compost or manure is a good idea.

### Propagation

Soak the seed well, just as you would beet seed (see Beet). Sow seeds an inch (2.5 cm) deep and three inches (8 cm) apart – deep bed method (see p. 106) also three inches (8 cm) apart. The plants need room, so make the rows 18 inches (45 cm) apart. The seed should be sown two or three weeks before the last expected frost, though in mild climates you can sow in late summer for harvesting and eating in winter and spring.

### Care while growing

Swiss chard needs little attention, though mulching is worthwhile.

### Pests and diseases

Swiss chard is hardy and resistant to pests and diseases.

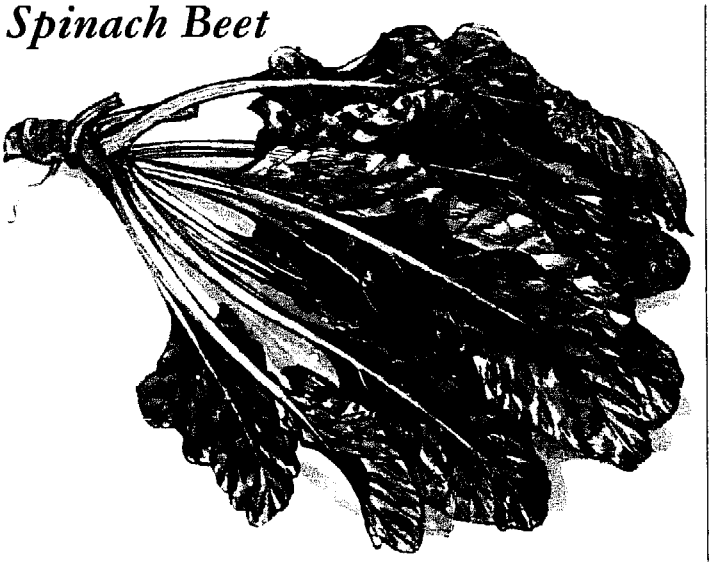
### Harvesting

When the leaves are seven inches (18 cm) long start breaking the outer ones off and eating them. As the leaves get bigger, tear the thin leaf off the midribs.

### RHUBARD CHARD

Rhubard chard is exactly like Swiss chard except that its leaves and stems are deep red in color. It is said to thrive in heavy soils better than its rivals.

## *Spinach Beet*



Spinach beet is a beetless beet, meaning that it does not make a swollen root, like common beet. It is also known as "perpetual spinach", because you can get a year's supply of leaves from only two sowings, instead of having to sow successionally through the year, as with spinach. You can eat the leaves and the plant will go on to produce more. Spinach beet is hardier than spinach; it is unlikely to bolt in summer yet can withstand frosts in winter. It tastes similar to spinach, but contains less oxalic acid.

### Soil and climate

A cool moist climate is best for spinach beet, and it likes good deep soil. It grows very well, like the rest of the deep-rooting beet family, in deep beds (see p. 106).

### Soil treatment

Dig deeply and add as much compost or manure as you can spare. You don't have to worry about forking roots with spinach beet, so there is no danger of adding too much fresh manure as there is with many root crops.

### Propagation

If you sow in spring and again in midsummer, you can have leaves to eat throughout the year. Sow seeds an inch (2.5 cm) apart in rows 18 inches (45 cm) apart. When the seedlings are well established, thin to leave six inches (15 cm) between plants. If you have a deep bed (see p. 106) allow six inches (15 cm) between plants in all directions.

### Care while growing

Keep the ground clear of weeds and pick off any flower stems that appear. Your crop will benefit from mulching.

### Pests and diseases

Spinach beet is not greatly affected by pests or diseases, but watch out for slugs (see p. 104) in the fall.

### Harvesting

Pull the leaves off the plants carefully by twisting them downward. Pick from the outside leaving newer younger leaves to go on growing. Never denude a plant altogether. Don't allow any leaves to become large and old, for this will stop the plant producing more. If they grow too old for eating, pull them off and put them on the compost heap.

# *Cucurbitaceae*

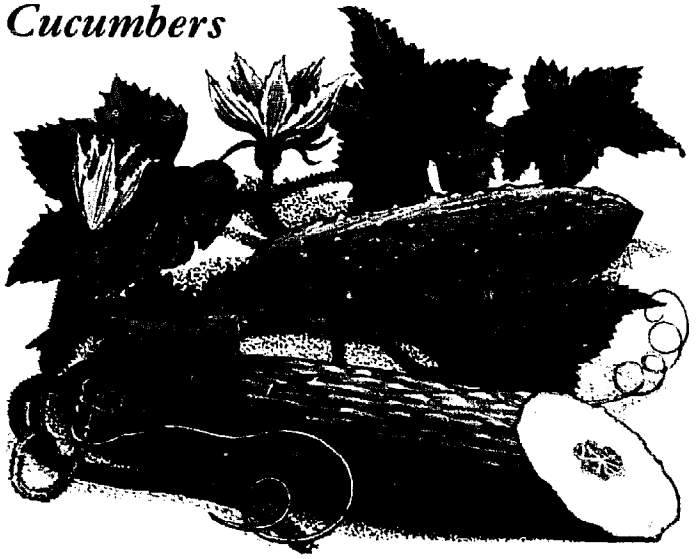
*Cucumbers, squashes, zucchini, pumpkins and melons* belong to the *Cucurbitacea*, a family which has evolved to live in extreme climatic conditions.

Nothing is more fascinating in working with nature than observing how plants have evolved to fill nooks and crannies left in the complex ecosystem of the larger and grander species. Thus in the huge tropical rain forests, where mighty trees strive against each other to reach the light, you will find soft, apparently defenseless fast-growing creepers using their mighty rivals to support themselves, making use of speed in growing and flexibility of habit to carry on a kind of guerilla existence down below.

Other members of the *Cucurbitaceae* are adapted to deserts, and these again make use of speed of growth, sacrificing strength and rigidity and all sorts of other virtues to this end. They shoot away quickly from a seed that has been lying dormant perhaps for years and store away the water of a flash rainstorm in quick-growing fruit. The Tsava melons of the Kalahari and Namib deserts of Africa are prime examples of this. As soon as it rains these spring up all over the formerly waterless and barren deserts and Bushmen, and other desert dwellers, are able to leave the water holes to which they have been confined and roam where they will – secure in the knowledge that they will find water wherever they go, in the Tsava that lie all about. Meanwhile the Tsava benefit from their depredations, for as animals and men eat their fruit and suck in their water the seeds get dispersed, to lie dormant perhaps for years again until the next rain.

Melons and cucumbers seem to be made to comfort men in hot dry climates – in Persia a dish of sliced cucumber in vinegar is often offered to the thirsty guest.

## *Cucumbers*



In temperate climates nearly all the cucumbers that have smooth edible skins can only be grown in greenhouses (see p. 204). There is one smooth-skinned strain, optimistically called "Burpless", that is hardy and can be grown out of doors, but otherwise the methods described on this page and the next apply only to common cucumbers. The common varieties of cucumber are not fully hardy, but can be grown with success in temperate regions as long as all risk of frost is avoided. They are much easier to grow than greenhouse cucumbers, and very prolific in favorable conditions.

### Soil and climate

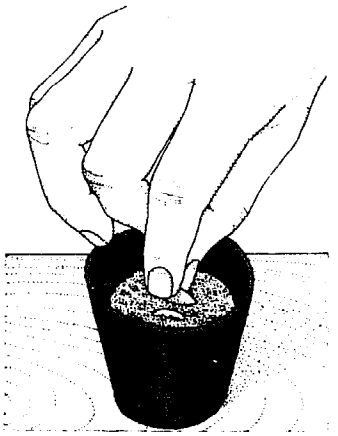
Cucumbers like soil that is nearly all compost or well-rotted manure. They will not stand wet feet, although they like plenty of moisture all through their growing period. Outdoor cucumbers can be grown successfully in most parts of the United States: they are fast growing and complete their life during the heat of the summer. Although they are easily injured by frost, they mature fast enough to be unaffected by winter weather.

### Soil treatment

The soil needs deep digging to ensure adequate drainage, and a large quantity of ripe manure or compost. Half manure and half earth is ideal. Dig it in a foot (30 cm) down in each position. Like tomatoes, cucumbers must have full exposure to the sun. The two crops like much the same soil, so it is a good idea to alternate cucumbers with tomatoes in a sunny bed up against a south wall or fence. Remember that cucumbers are good climbers, and take up far less room and do better if they are allowed to climb. If you can train them up a fence or a trellis on a wall so much the better.

### Propagation

You can sow cucumber seeds out of doors after all danger of frost is past. If there is an unexpected cold spell, cover them with glass jars. Remove the jars when the plants get too big for them. Cloches are even more useful, because they can be left on longer and can be improvised with transparent plastic and wire.



**SOWING SEED INDOORS**
*To get early cucumbers, start them off indoors in peat pots or soil blocks. Sow two seeds on edge in each pot or block. Do not press the compost down; cucumbers are that rare thing, a vegetable which dislikes firm soil. Water them and keep them warm, but out of direct sunlight. You can then transplant them, at about the time of the last expected hard frost, without disturbing the roots. Sow more seed outdoors at the same time.*

The alternative is to start your cucumbers indoors in peat pots or soil blocks. Then plant them out, long after the last possible frost, in their prepared positions. If your land is heavy and wet it is best to plant them on ridges; because if

you plant them on the flat in badly drained land, they are likely to die from damping off.

If you are not letting them climb they can do with six feet (1.8 m) of space all round them; four feet (1.2 m) is the absolute minimum. If you are planting them in a deep bed (see p. 106), allow two feet (60 cm) each way, or else stagger them among other crops. I sometimes plant mine right on top of an old compost heap. They love it. When you plant them out sow some more seed outdoors as well – this will give you a second crop just when your first is running out.

### Care while growing

Cucumbers must have water all the time: many people sink a flowerpot into the ground near each plant and pour water straight into this so that the water quickly reaches the roots. Keep them well weeded.

TRAINING CUCUMBERS
*Cucumbers thrive if they are encouraged to climb. Train them up a fence or trellis (left); when they reach the top, pinch out each growing point (below).*

When they have six or seven true leaves – not seed leaves – it is best to pinch out the growing points to make them branch and straggle. Do not remove the male flowers from outdoor cucumbers. Do this only with smooth-skinned cucumbers – the ones that you can only grow in the green house. Keep the fruit off the ground by placing a piece of plastic sheet, tile or glass under each one.

### Pests and diseases

***Mildew or blight*** This can develop in very hot and muggy conditions. It produces white powdery patches on leaves and stems. Avoid by planting resistant varieties.

***Cucumber beetle*** These are spotted or striped beetles. The adults attack the leaves, and the larvae the stems and roots. Repel them with nicotine spray (see p. 104).

***Cucumber mosaic virus*** Leaves become mottled and shrivelled. Pull and burn immediately. Plant resistant varieties.

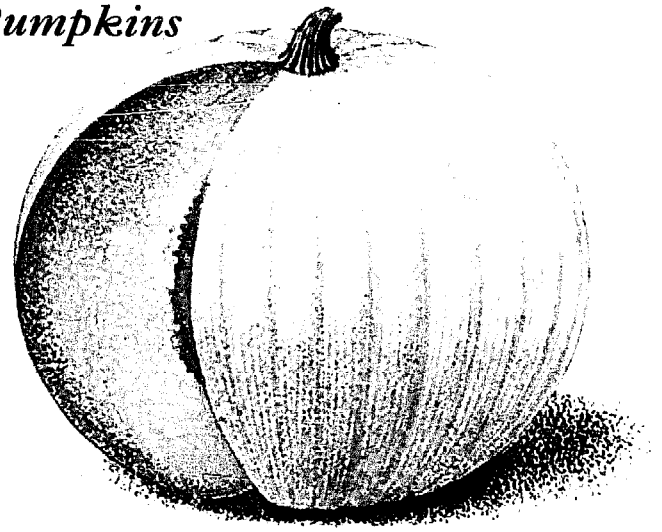
### Harvesting

Pick and eat your cucumbers as soon as they are ready. Above all don't leave any to grow old on the vines.

## GHERKINS

The gherkin is the favorite for small pickles and relish. Gherkins don't need quite as much space between plants as cucumbers do; two feet (60 cm) is about right. Pick them when they are only two inches (5 cm) long.

## *Pumpkins*



Pumpkins are a must for Halloween carving and Thanksgiving pumpkin pie. They also make delicious custards and casseroles, and hull-less seeds make a good snack.

### Soil and climate

Pumpkins like humus if they can get it, but they will grow on unmanured ground as long as it is well drained. They need plenty of water.

### Propagation

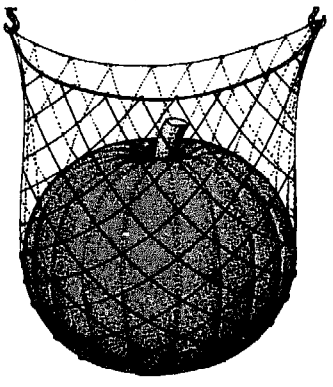
You can sow pumpkin seed out of doors, under polyethylthene cloches or inverted jam jars in spring, or else without protection in early summer. You can also sow seed indoors in peat pots or seed boxes shortly before the last frost, and plant the seedlings out at the start of the hot weather. Allow four feet (1.2 m) between plants, or 30 inches (75 cm) if you use a deep bed (see p. 106).

### Care while growing

Let each side-shoot grow a male flower – a flower without a pumpkin attached to it. Then, when the next female flower – a flower with a tiny green pumpkin – appears, cut the shoot short just above the female flower. This will encourage the growth of several smallish pumpkins instead of one enormous one. Place upturned saucers under your pumpkins to prevent them suffering from rot (see Squashes).

### Harvesting

Color is no indication of ripeness. It is best to wait until the first frost before cutting off the pumpkins. Leave about two inches (5 cm) of stalk on each one.



STORING PUMPKINS
*Pumpkins need to be stored at a warmer temperature than any other vegetable. 50-60°F (10-16°C) is ideal. Never hang them up by their stalks, as eventually these will shrivel up, and the pumpkins will drop and bruise. By far the best way of storing them is to hang them in nets in an airy place.*

# *Squashes*

There is a bewildering variety of squashes. The best thing to do is to try several different ones, see which you like, and then plant one good one for eating fresh and another that is good for storing. Summer squash is one of the most prolific vegetables you can grow, so don't overplant. Size is unimportant; very large squashes tend to be tasteless. They are delicious, especially when stuffed with sausage and baked.

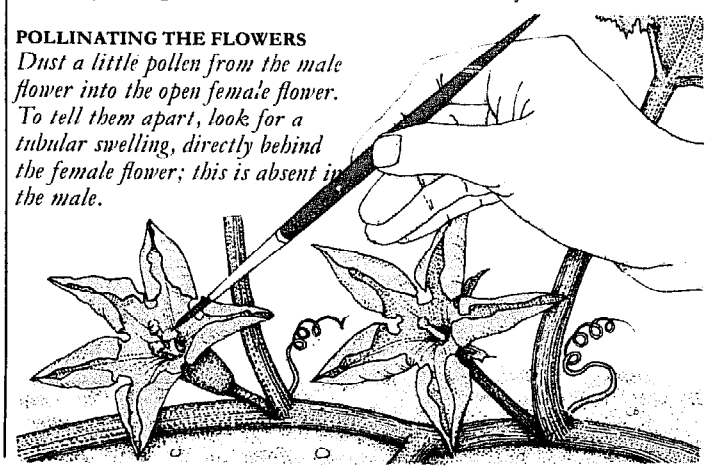
## Soil and climate

The best place to grow squashes is on a compost heap. They will not grow very well on unmanured ground and like as much humus as they can get. They don't like poorly drained land, but they do need plenty of moisture during their short, quick growing season. Work in plenty of compost or manure, and lime if the pH is below 6.

## Propagation

In warm climates sow the seed straight outside in the bed at the beginning of summer. In areas with very short summers you can sow them inside in peat pots or seed boxes two weeks before the last frost and plant them out toward the beginning of summer. Otherwise sow the seed out of doors *in situ*, under cloches or upturned jam jars, and remove the cloches when the warm weather begins. Allow four feet (1.2 m) between plants – 30 inches (75 cm) for a deep bed (see p. 106). Sow two, or even three, seeds two inches (5 cm) deep in each position, and when they declare themselves remove the weakest plants, leaving only one. It is said to be best to sow the seeds on edge and not lying flat. I find they grow whatever I do.

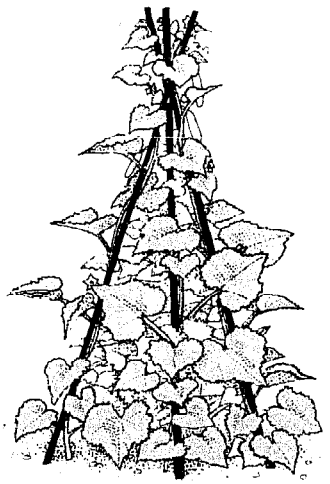
**POLLINATING THE FLOWERS**
*Dust a little pollen from the male flower into the open female flower. To tell them apart, look for a tubular swelling, directly behind the female flower; this is absent in the male.*



## Care while growing

Never let them go short of water. Mulching is very good for them. Though insects pollinate some flowers, it is important to pollinate by hand as well. Trailing varieties must be trained up fences or a wigwam of sticks.

**TRAINING UP TRIPODS**
*If trailing varieties of squash are allowed to grow along the ground, they take up a great deal of room; the shoots can be several yards long. To save space, train them to run vertically. Grow them up trellises or chicke wire; alternatively train them up tripods. Tie three poles, seven feet (2 m) long, together at the top, and train one squash plant up each pole. When the shoots reach about five feet (1.5 m) high, pinch out the growing points.*

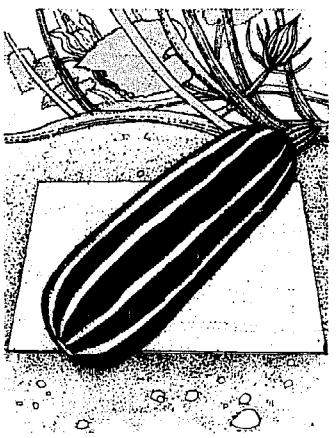


## Pests and diseases

***Mildew*** White patches caused by lack of moisture in the soil, and a high degree of humidity in the air, appear on leaves. The solution is to water them more.

***Vine borer*** This pest hollows out the squash stems; the leaves go limp and die. Burn affected stems and prevent the pest spreading by earthing up the remaining ones.

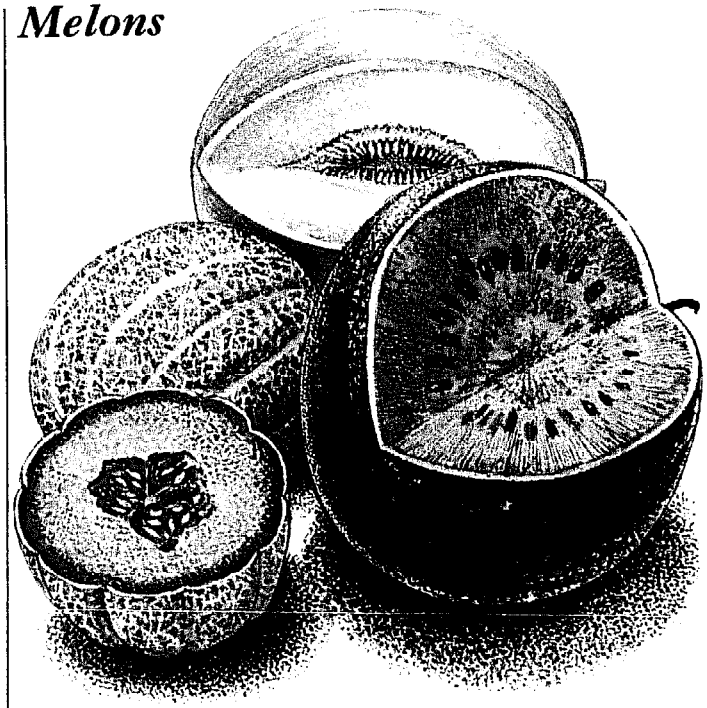
**SUPPORTING SQUASHES**
*As the winter squashes appear and grow to their full size, there is a danger of rot coming up from the earth and affecting them. So keep the squashes just off the soil, by laying a piece of plastic sheet, tile, wood or glass under each one.*



## Harvesting and storing

Pick summer squash and zucchini when small. If you leave them to mature, they will lose flavor. Keep picking to make more grow. Don't harvest winter squash until they are hard, or until the frost is really threatening. Cut the stems off several inches from the vegetables; don't break them off, as the wound lets in rot, and be certain not to bruise them. Store like pumpkins (see Pumpkins).

# Melons



There are three main types: the true cantaloupe, which comes from Europe, the muskmelon, and a group which includes honeydews and casabas. My own preference is perhaps for the cantaloupe, but I have never tasted a melon – as long as it was ripe and freshly picked – that was not a memorable experience.

### Soil and climate

Wherever you get three months of summer which culminates at melon-ripening time with days of 80°F (27°C) and nights of not less than 50°F (10°C) you can grow melons if the soil is right. Honeydews and casabas take another month or more.

They like lightish soil with plenty of humus, not heavy clay, and they like it alkaline: a pH over 7 is best. You will probably have to lime for them.

### Soil treatment

Unless your soil is already half manure or compost dig in plenty, enough to give you a covering of at least four inches (10 cm) before you work it in. Or else dig out "hills" or stations, spaced about four feet (1.2m) apart, digging to one spade's depth and several spade widths square. Dump in a big forkful of manure at each hill, and then cover this with earth again so that each station forms a shallow mound.

### Propagation

In hot and temperate climates just sow the seeds two weeks after the last frost, edge-upward, six to a hill, and an inch and a half (4 cm) deep; keep them well watered. If you have a deep bed (see p. 106), you should sow melons 18 inches (45 cm) apart; they will do better if you intercrop them with other plants. Thin to two or three plants in a station when the seedlings are established.

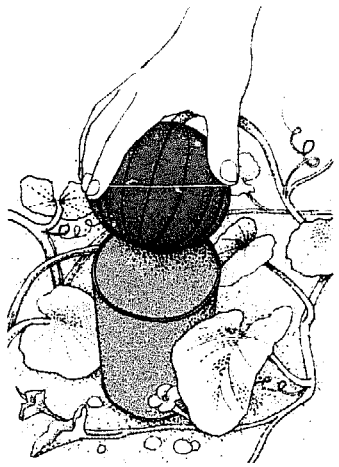
In cold climates you must sow indoors in early spring or else outdoors under cloches, mini greenhouses (see p. 111) or upturned glass jars. If you sow them indoors don't transfer them out of doors until all frosts are past and summer has definitely begun.

A method of getting them off to a flying start is to sprout the seeds first, by putting them between wet blotting paper, in a warm place until they begin to sprout. Do this about a week before you would normally sow the seeds, indoors or out. Don't let them dry out but don't drown them. Be careful not to break the sprouts when planting out.

Growing melons in a cool climate is a race against time. Fruit which sets after the middle of summer should ripen before the frost kills it off.

### Care while growing

Treat just like outdoor cucumbers. As soon as the little melons are as big as your fist, balance them on a glass jar or an old can to keep them off the ground. They are more likely to ripen and less likely to rot like this.



**PROTECTING MELONS**
*You should care for your melons in the same way as for outdoor cucumbers. They need plenty of water and must be kept weed-free. When the little melons have grown to about the size of your fist, balance them on an old can to keep them off the ground. This will keep out rot and also makes them more likely to ripen.*

### Pests and diseases

***Cut worm*** These pests eat through the stalks of young seedlings. If you get them in your garden, put paper or cardboard collars around the small plants when you plant them out.

***Anthracnose*** This is a fungus disease which causes brown spots on the leaves and ultimately causes the melons to go moldy. You can avoid it – along with some other fungus diseases – if you don't grow cucurbitaceous plants more than once on the same ground in four years.

***Botrytis, or gray mold*** Very wet conditions may bring this on. Although the plants need constant moisture there is no need to soak the ground. If botrytis strikes, all you can do is to destroy all affected fruits and herbage.

### Harvesting

Melons generally begin to crack around the stems when ripe, and the fruit will break easily from the stem. Tapping helps when you have had experience: a ripe melon makes a unique hollow sound. Some experts get on their hands and knees and sniff the melons to see if they are ripe. You don't store melons; you just pick them and eat them.

## WATERMELONS

These need really warm weather for at least four months and a terrific lot of space because the vines straggle over large areas. Unless you have both of these, and a sandy or very light soil, don't consider them. But if you have these conditions, go ahead and grow them – there is nothing so refreshing on a hot day. When you think a watermelon is ripe knock it with your knuckles and heed Mark Twain's advice: a ripe melon says "punk", an unripe one says "pink" or "pank".

# *Compositae*

*Lettuce, chicory, endive, salsify, scorzonera, dandelions, globe artichokes, cardoons, and Jerusalem artichokes* are all members of the *Compositae*.

The *Compositae* derive their name from the fact that their flowers, which look just like single flowers, are in fact clusters of many small flowers packed together and cunningly disguised as single flowers. The family contains two important groups, which are best described as the salad group and the thistle group. The salad group – lettuce, chicory, endive, salsify, scorzonera and dandelions – are fast-growing, soft-stemmed plants, which gardeners should usually treat as annuals. They have white milky sap in their stems and a slightly bitter taste. This is the family from which most of the ingredients that make up the basis of good salads come.

The thistle group embraces a lot of the world's thistles, of which globe artichokes and cardoons are of especial interest to gardeners. Closely related to these are a number of other plants that look very different, but to a botanist are quite similar; these include Jerusalem artichokes, Chinese artichokes and sunflowers. The vegetables in this group generally have to be cooked, but it is surprising what you can eat if you are hungry. Not long ago I was cutting down spear thistles in my meadows when somebody came along and told me that I could eat them. She proceeded, somewhat painfully, to peel the stalk of one of them (a young one) and yes, you could indeed eat them. You would have to be very hungry to make a meal of them though – unless you found a better way of getting the prickles off.

## *Lettuces*

Lettuces have been cultivated for such a long time that several distinct and firmly-fixed varieties have developed. The three common types are cabbage lettuce, cos lettuce and butterhead lettuce. The cabbage variety is green on the outside with crisp, white leaves which form a closed heart; the cos has tall green leaves and forms a loose, elongated head; and the butterhead has tender, green leaves in a flattened, soft head.

With careful planting and selection of varieties you should be able to grow lettuce for a large part of the year, at least in temperate climates. For the purposes of cultivation, lettuce falls into three categories: winter lettuce, spring lettuce and summer lettuce. Winter varieties are bred to grow through mild winters. They do especially well if they are covered with cloches. Spring varieties are very fast growing so that they can come to harvest in early summer. Summer lettuces grow big and lush and form the vast bulk of the lettuce crop. Lettuces are excellent for small gardens and window-boxes, and grow well indoors too.

### Soil and climate

Lettuces like cool moist conditions. They will grow well in shade, and are inclined to "bolt", or run too quickly to seed, in hot sun. Thus they do best in cooler and moister climates, and should only be grown in winter in hot ones. To grow lettuces well you need good rich soil. The ground should be well-drained but humus-rich to retain water. Lettuces will not grow well in heavy ground, so if you have, say, a clay soil, you must temper this for some years with plenty of manure or compost. The deep bed method (see p. 106) is ideal for lettuces.

### Soil treatment

The best plan is to give the lettuce bed a heavy dressing of really well-rotted manure or compost: a pound (500 g) to the square foot (900 sq cm) is not too much. The soil should be pH 6 or 7, so lime if necessary.

### Propagation

You can sow lettuce seed direct in the bed, or in a seed-bed or seed boxes for transplanting. Seed will only germinate in fairly cool moist conditions, so in very hot countries it is a good idea to put the seed between two sheets of wet blotting paper and keep it in a refrigerator for five days before planting. Allow ten inches (25 cm) between plants and one foot (30 cm) between rows – deep bed (see p. 106) eight inches (20 cm) all round.

Winter lettuce should be sown out of doors in the early fall. Spring lettuce can be started indoors in seed boxes (or peat pots) in late winter, or else sown out of doors in fall and allowed to stay more or less dormant during the winter protected by cloches or even some straw or leaves. Summer lettuce is best sown direct out of doors, and sown suc-

cessionally right through the summer. Lettuces are also a good crop for window-boxes or indoor culture.

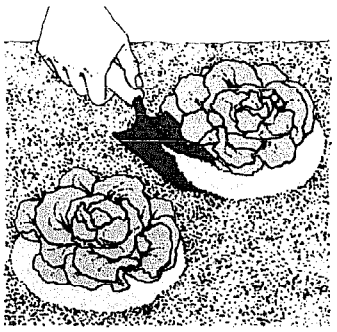
### Care while growing

Lettuces should be hoed, and watered if necessary. Mulching is also beneficial. Shade the plants if there is a very hot sun, and in winter protect them from heavy frost.

### Pests and diseases

***Cut worm*** Cut worms sometimes gnaw into the stems of seedlings near the ground. If your lettuces suffer badly from this, you should place collars around the seedlings when you plant them out. This will also discourage slugs, who love to eat lettuces.

***Lettuce rot*** In some gardens there is a rot which comes from the soil and may attack the lettuces spreading through the plants. This can be prevented by a layer of sand on top of the ground around each lettuce. With proper rotation, however, this should not be a problem.



**PREVENTING LETTUCE ROT**
*Lettuce rot comes from the soil and spreads through the plant, via the lowest leaves that are touching the soil. Avoid it by spreading a layer of clean sand over the soil around each lettuce. Also, never plant lettuces in the same place two years running.*

### Harvesting

Lettuces will not store and lettuces that have been stuffed inside a refrigerator for days are worthless. So pull them when you want them – making sure that the roots come out with the lettuces. Don't let them grow to seed (unless you want seed), but pull them before they have a chance to bolt, and give them to your poultry or put them on your compost heap when they become over-ripe.

## CELTUCE

Celtuce or stem lettuce, is grown for its thick stems as well as its leaves. It needs a soil with lots of manure or compost added to it. Sow successionally in shallow drills from spring to midsummer, and thin the seedlings to about twelve inches (30 cm) apart. Water the plants well, as they tend to get tough if allowed to dry out. Otherwise treat them as you would lettuce. The stems will be ready for cutting three months after sowing. You can eat the leaves as well, and these should be harvested as they form.

## CORN SALAD OR LAMB'S LETTUCE

In my view corn salad, or lamb's lettuce, which is a member of the family *Valerianaceae,* is rather tasteless, but its virtue is that it provides salads during the winter. It grows wild in corn-fields, and this gives it an extra hardiness when it is cultivated in gardens. Sow it in early autumn and treat exactly as you would lettuce. When the seedlings have three leaves, thin them to six inches (15 cm) apart. If the winter gets very hard, cover the plants with a mulch of leaves until early spring when you can begin picking again. Harvest a few leaves from each plant as you need them.

# *Chicory*

Chicory, which is also called French or Belgian endive, produce green leaves which are eaten as salad in summer, and, more importantly, shoots which are forced indoors to provide winter salads. Witloof is the best variety for winter forcing.

### Soil and climate

Chicory prefers a coolish climate, but will grow virtually anywhere. A rich soil with a neutral pH – 6 to 7– is best.

### Soil treatment

Dig the bed at least two spade-depths deep, so that the long straight roots will come out easily when you need to dig them up in the autumn. Chicory grows well without mature compost or manure, but if you have some to spare it is worth digging it in well, especially in deep beds.

### Propagation

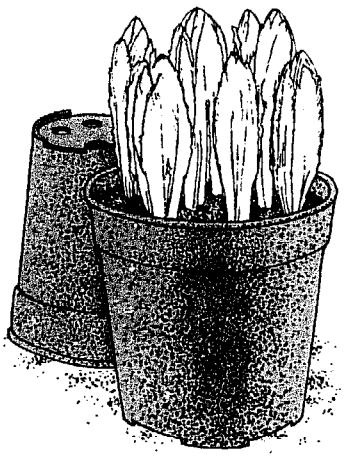
Grow chicory from seed sown half an inch (1 cm) deep and three inches (8 cm) apart in rows two feet (60 cm) apart, or, if you have a deep bed (see p. 106) in positions six inches (15 cm) apart in both directions. Sow successionally through spring and summer for salad; in June for winter forcing.

### Care while growing

Weed your chicory bed and keep the soil loose. If you sowed chicory for forcing, thin to six inches (15 cm) apart and eat the thinnings as salad. Chicory suffers very little from pests and diseases.

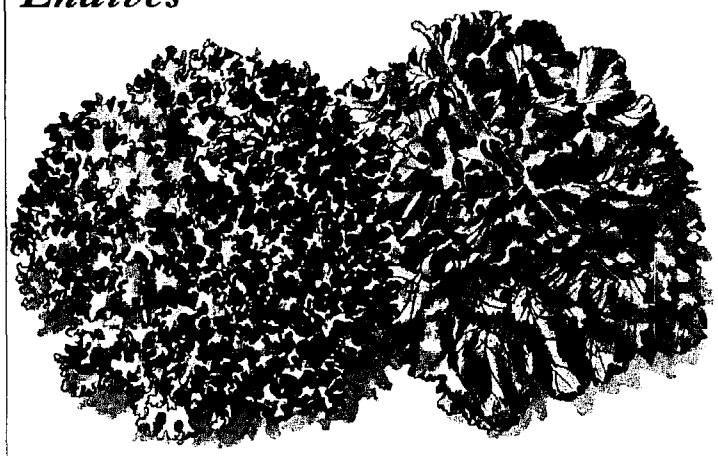
### Harvesting and storing

Pick leaves for summer salad as you want them. Dig your roots for forcing after the first bad frost, and force them as described below.



**FORCING CHICORY**
*After the first bad frost dig up a few chicory roots for forcing. Cut off the tops to within an inch (2.5 cm) of the crown. Plant them in a pot, or box of soil in a dark cellar, with the temperature not less than 50°F (10°C). Shortly new sprouts, or chicons, will grow; if you break them off carefully a second crop will follow. Never pick them until you need them – even an hour in the light will make them droop.*

## *Endives*



Endive is one of the many minor salad plants, which can be eaten either raw or cooked. It has more flavor, but lacks the delicious crispness of lettuce. Curly endive comes to harvest in late summer; broad-leaved, or Batavian, endive is picked in autumn or winter.

### Soil and climate

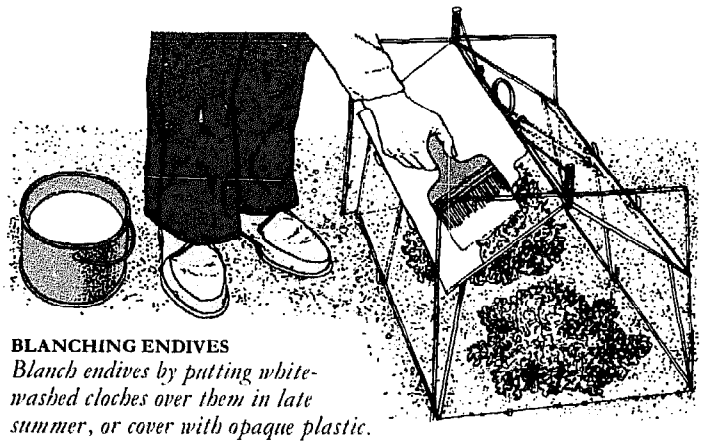
Endive will grow in practically any soil. A neutral pH between 6 and 7 is best, and the more humus in the soil the better. Endives prefer a cool moist climate to a hot dry one.

### Propagation

Sow curly endive seeds thinly in shallow drills at the beginning of summer. Make two more sowings at three week intervals. Sow broad-leaved endive in late summer. Single the seedlings when they appear, to nine inches (23 cm) apart or six inches (15 cm) in deep beds (see p. 106).

### Care while growing

Endives don't like too much sun, so shade them if necessary and keep them moist. In cooler climates this shouldn't be necessary. Three or four months after sowing start blanching by covering the plants with something that will keep out the light. Whitewashed cloches are ideal. Alternatively, you can pull them up and plant them in earth in seed boxes and put them in a dark place.



**BLANCHING ENDIVES**
*Blanch endives by putting whitewashed cloches over them in late summer, or cover with opaque plastic.*

### Harvesting

Simply eat endives once they are blanched; this will be about three weeks after you covered them.

## *Salsify*

Salsify or "oyster plant" is grown mainly for its long roots, though the leaves may also be eaten. The root has a delicate oyster flavor and is delicious both cooked and raw. Parboil, then brown in butter for a real treat.

### Soil and climate

Salsify likes a deep, rich loam. If you have to grow it in heavy clay take out a trench a foot (30 cm) wide and 18 inches (45 cm) deep and fill it with well-rotted manure.

### Soil treatment

A bed dug deeply with well-rotted manure or compost is best. Fresh manure will cause the salsify root to fork. The soil should have a neutral pH, between 6 and 7.

### Propagation

Sow seed in early spring an inch (2.5 cm) deep and two inches (5 cm) apart in rows about a foot (30 cm) apart. In a cold climate you can sow it anything up to a month before the last frost, but you must cover it with glass. Thin to four inches (10 cm) when the plants appear. Sow closer and thin to three inches (8 cm) in a deep bed (see p. 106).

### Care while growing

Keep the salsify weeded, and mulch in the fall before hard weather sets in. It rarely suffers from pests or diseases.

### Harvesting and storing

The roots should be allowed to grow to an inch and a half (4 cm) in diameter and eight inches (20 cm) long before you harvest them. They are improved by frost – even quite a hard frost – so you can leave them in the ground quite late. But in very cold climates, harvest them in the autumn and store them in damp sand in a cool cellar. Since salsify is a biennial, it will go to flower and seed in the spring of its second year. If you still have some in the ground at this stage, cut the flower stalks before they get too hard; you will find they taste very good if you eat them like asparagus.

## SCORZONERA

Scorzonera, known also as black or Spanish, salsify is grown in the same way. One minor difference is that you can, if you want, treat it as a biennial, digging up and eating the roots in their second year of growth.

## *Dandelions*

The wild dandelion has been tamed and improved to make a very useful vegetable. The leaves can be used, sparingly, in salads and are especially useful for salads early in the year before the first lettuces are ready; mulched over, the plants will survive the winter and grow away fast in the spring. Cooked dandelion leaves make an excellent vegetable, better tasting and far more vitamin-rich than spinach. The roots may be dried, ground, and used as a substitute for coffee. The coffee tastes quite good, but doesn't give you the lift that caffeine does. We might all be a lot healthier if we went over to it. The flowers make fine wine, but it is sensible to eat the leaves of your cultivated dandelions and gather flowers from wild dandelions.

Dandelions are perennials; if you look after them they will last for years.

### Soil and climate

Dandelions thrive in any soil and any climate except very hot ones.

### Soil treatment

Dig well and incorporate compost or manure.

### Propagation

Dandelions grow easily from seed which can be bought from seed merchants. Sow successionally from the middle of spring until midsummer. Sow thinly in rows 18 inches (45 cm) apart and thin to a foot (30 cm) apart in the rows when the leaves are two inches (5 cm) long. On the deep bed (see p. 106) broadcast and subsequently thin to about a foot (30 cm) apart each way.

### Care while growing

Water if the bed dries out and keep it well weeded. Cover the plants with a light mulch in cold winters. Pick off any flowering shoots (use wild dandelion flowers for wine).

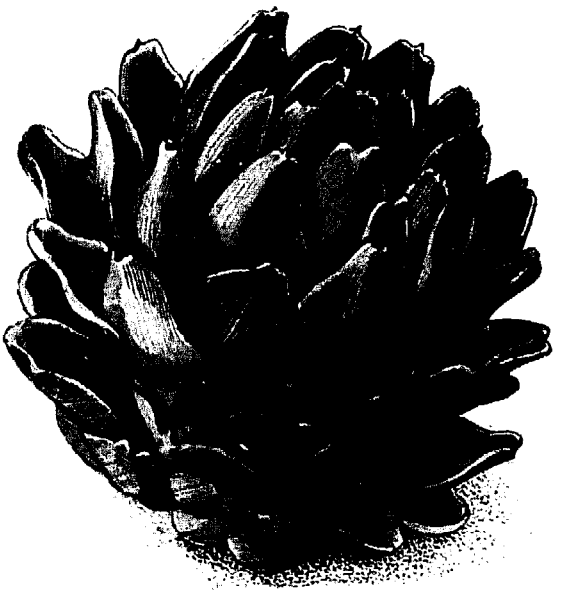
### Pests and diseases

Cultivated dandelions are closely related to their wild ancestors and are therefore very resistant to disease. Keep the slugs away though (see p. 104).

### Harvesting

Dandelions are perennials so you must not cut too many leaves off during the first summer of their lives, because the roots gain strength from the leaves. Cut them hard the second year. You can dig dandelion roots up in the autumn and force them to grow shoots in the same way you can force chicory (see p. 159).

## *Globe Artichokes*



Eaten as it should be – that is, when still young and tender – the globe artichoke is, in my view, supreme among vegetables. But more than that, it is as beautiful a plant as you are likely to have in your garden. A thistle *par excellence*, I've actually seen a globe artichoke grow to a height of ten feet (3 m). You will, however, need a fair amount of space to grow globe artichokes, so they are better left out of the very small garden. On the other hand, they are decorative enough with their fern-like, greyish leaves not to be grown only in the vegetable garden. They are very different from Jerusalem and Chinese artichokes.

### Soil and climate

Low-lying black alluvial soil is ideal for globe artichokes. It should be moist but not waterlogged. If you have not got this – and there is a good chance you won't have – any rich, moist soil will do. They are not really winter-hardy in cool temperate climates since hard frosts cut the leaves right down. Even so the roots will survive and the plants will shoot up in the following spring. Some protection, such as straw or leaves, helps them to survive the winter.

### Soil treatment

The bed for your globe artichokes should be dug deeply. Work in large amounts of organic material. The pH should be around 6.5, so test for lime.

### Propagation

Globe artichokes can be grown from seed and it doesn't take as long to get heads from them this way as many people seem to think. Sow the seed in a hot-bed in late winter, plant out in spring, and you should be eating artichokes in early autumn. You can also sow seeds in their permanent position in the spring, but you will have to wait to harvest blooms until the next year.

A popular alternative to sowing seed is to grow the artichokes from suckers or offsets. If you uncover the old plants at the roots in the spring or autumn, according to your climate, you will find a number of small shoots getting ready to grow. Cut some of these out carefully, taking with each shoot a "heel" which is a bit of the mother plant. But don't take so much as to harm the mother plant. Plant these

suckers straight into the ground at about the same depth they were before. Do this in early spring in cold climates or in autumn in hot ones. They should give you heads by the following summer.

Spacings vary according to variety and the kind of soil the plants are to grow in – in very rich soil plant them further away from each other because they are likely to grow much bigger. Generally, four feet (1.2 m) between plants is about right. Make it five feet (1.5 m) in a deep bed (see p. 106), because the soil will be rich.

You can have good heads to eat for six months of the year in cooler climates if you protect some old plants very well in the winter. These will give you blooms in late spring and early summer. If you planted good suckers in early spring these will give you a crop in late summer. And you'll get heads in the fall from suckers planted say six weeks after the first planting. In very hot climates you should get most of your crop in the winter and spring.

Since globe artichoke plants tend to lose vigor after a few years (though I have had good crops from an eight-year-old plant), try replacing a quarter of your total crop every year with new plants. That is, each autumn dig out the oldest quarter of the crop, and replace them in the spring with new plants. But take the suckers from the old plants before scrapping them and plant them in sand or soil indoors. In the spring these can be used for replanting.

### Care while growing

Heavy mulching with compost or manure is always a good idea with globe artichokes. And where the winters are cold, it is best to cut the plants down to the ground in the fall and to pile hay, straw or leaves over them. But if you do this, uncover the plants on mild days to let them dry out. In summer droughts, soak the ground around the plants regularly and thoroughly.

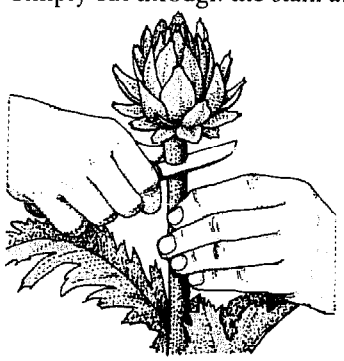
### Pests and diseases

***Botrytis*** This causes a gray mold on leaves and stalks and may attack plants in very warm wet seasons. If it does, remove and burn all affected plants.

***Artichoke leaf spot*** In hot muggy weather, leaves may go brown and die. Use a weak solution of Bordeaux mixture.

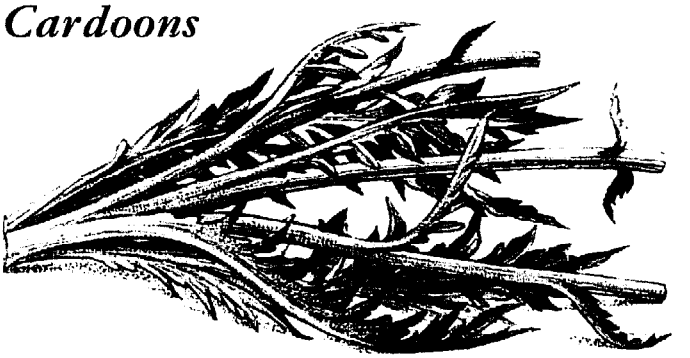
### Harvesting

Ignorance of the following rule makes artichokes less popular than they should be: harvest them when they are very young! Don't wait until they are huge great prickly things, as hard as wood and as sharp as needles. If you cut them when they are still tight, green and small you can eat practically the whole thing. If they are too old only the bottom tips of the leaves and the heart will be edible. Simply cut through the stalk about an inch below the globe.



**HARVESTING GLOBES**
*If you harvest your globe artichokes while they are still very young, you can eat the whole head, instead of just the heart and the base of the inner leaves. Harvest the globes by cutting through the stalk about one inch (2.5 cm) below the globe.*

## *Cardoons*



Cardoons are thistles which are very closely related to globe artichokes. They have been specifically bred for their stems, which should be eaten blanched. They take up a lot of space but are delicious deep-fried, sautéed or in soups and stews.

### Soil and climate

Although strictly speaking perennials, cardoons are always grown as annuals, so they are not so fussy about soil as globe artichokes. Cardoons grow primarily in warm climates and they don't like it too wet.

### Soil treatment

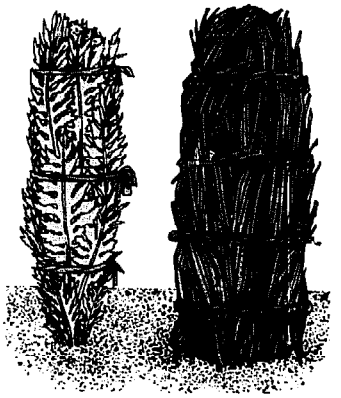
Dig holes about one foot (30 cm) across and three feet (90 cm) apart, and fill these with compost. Or you can dig out trenches as for celery (see Celery).

### Propagation

Sow three or four cardoon seeds in each hole or at three foot (90 cm) intervals along the trench in the spring. Alternatively, sow in peat pots a little earlier and plant out toward the end of spring. Pull out all but the strongest plants when they appear.

### Care while growing

Cardoons should be kept watered and weeded, and, since they need blanching, they should be hilled up like celery (see Celery). But before hilling up you should wrap the plants in straw, or put a length of drain pipe over them to protect them. They are rarely affected by pests or diseases.



**BLANCHING CARDOONS**
*About three weeks before harvesting, bunch up the cardoon plants and tie them together. Then wrap them round completely with straw, or anything else that will keep out the light. Leave the tips of the leaves showing. When the blanching process is complete, you will have cardoons all through the autumn and winter.*

### Harvesting

You can begin to harvest your cardoons in autumn and continue well into the winter. Three weeks before you intend to harvest a batch, blanch the plants, which may be three feet (90 cm) tall. Gather them up and tie them together, then wrap each one round with straw.

# *Jerusalem Artichokes*

It is most unfortunate that the Jerusalem artichoke was so named, since people constantly mix it up with the globe artichoke. Strangely, they are members of the same family, but only a botanist could see any resemblance between them. The Jerusalem is in fact more closely related to the sunflower; the plant looks very similar except that it has small flowers and tubers on its roots. The tubers are pleasant to eat and are especially good for diabetics because they contain a special form of sugar and no starch.

### Soil and climate

Jerusalem artichokes grow best in light or sandy soil. They do very poorly in clay. In light land they will grow like weeds if you let them – as high as seven feet (2 m) – and they will smother any plant that tries to compete with them. They grow in practically any climate.

### Soil treatment

If you have to grow them in heavy soil dig it well, make sure it is free of perennial weeds and add as much manure or compost as you can. Sandy soil is little trouble, although the more manure the bigger the crop.

### Propagation

Simply dig a hole with a trowel and plant the tubers six inches (15 cm) deep. I put them in in late winter. Even a tiny scrap of a tuber will produce a plant. Plant 18 inches (45 cm) apart each way – deep bed method (see p. 106) 15 inches (38 cm). They make a smother crop.

Once you have had a crop of Jerusalem artichokes it is very difficult to get rid of them. They will come up again year after year unless you hoe them out constantly.

### Care while growing

In light land you don't need to do anything. In heavy land hoe between them because Jerusalem artichokes are not vigorous enough to beat weeds. Alternatively, mulch heavily. Pests and diseases rarely affect them.

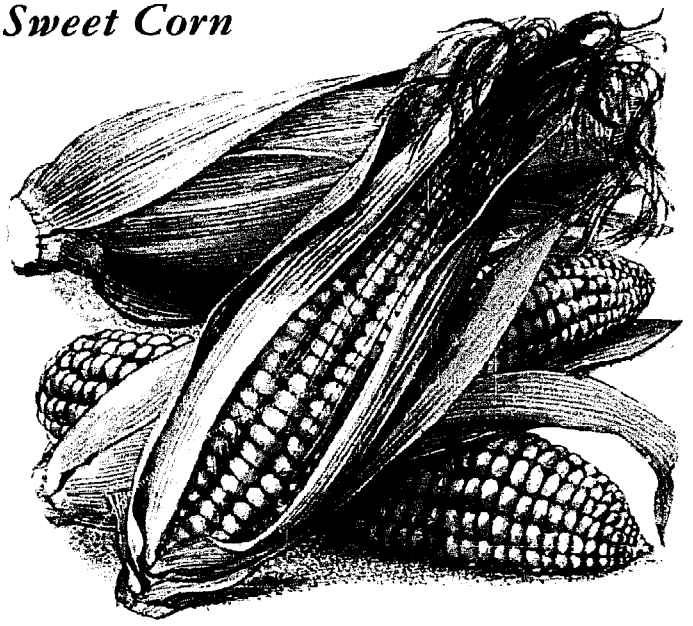
### Harvesting and storing

Dig them up in the late fall, or else leave them in the ground until you want them. In climates with hard frost dig them up after the tops have died back and store them. The tops are fine for mulch, and can be woven as a windbreak.

### CHINESE ARTICHOKES

Strictly speaking a member of the *Labiatae* family, the Chinese artichoke is also grown for its tubers, in exactly the same way as the Jerusalem artichoke. Regular watering and feeds of soluble manure will add extra flesh to the tubers, which should be lifted in autumn when the leaves die.

# *Sweet Corn*



Sweet corn, which is basically field corn picked very young, is a member of the *Gramineae,* or grass family: this includes popcorn and all the world's cereal crops and a lot of other species.

The plants, which I have seen as tall as 12 feet (3.6 m), send a mass of fibrous roots deep into the soil. This takes a lot out of the soil, but when in due course the plants are returned in the form of compost they put most of the goodness back again. There are small varieties bred for gardeners which grow to only four feet (1.2 m). These are useful in a small garden because they don't cast so much shade.

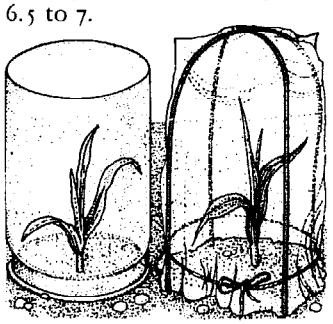
### Soil and climate

Sweet corn likes a deep, well-drained, humus-enriched loam. Clay is too cold for it in northern climates; it must have an early start, as it needs ten to twelve weeks to come to maturity. It will grow in light sandy soil, but only if there is plenty of humus in it. Hungry old gravels and sands just won't grow it at all. It needs good soil.

Depending on the variety, sweet corn prefers about three months of hot sun and warm nights. However you can grow it in fairly cloudy places, if you start it early enough.

### Soil treatment

Sweet corn needs plenty of humus thoroughly mixed into the soil (not just dumped on top at the last minute) because the roots go deep as well as spreading wide. A couple of inches (5 cm) of well-rotted manure dug well in a spade's depth deep is ideal. Alternatively plant sweet corn after a heavily manured main potato crop. Soil must be neutral: pH 6.5 to 7.



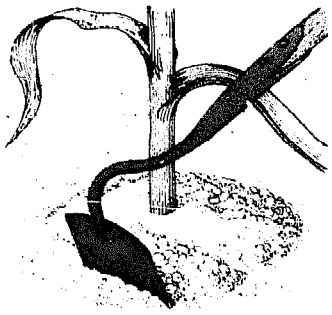
### Propagation

It is better to sow sweet corn in wide blocks instead of in long thin lines. This is because it is wind-pollinated and in a thin line some plants may get missed. If this is difficult, plant two close rows which will form tassels at the same time. To give it a flying start sow it outside two weeks before the last probable frost. Sweet corn doesn't take to being transplanted but this doesn't mean it can't be done.

Sow the seed about a foot (30 cm) apart each way, in blocks or in the deep bed (see p. 106).

### Care while growing

Sweet corn doesn't like to get short of water. Mulching does it nothing but good. Hilling up is beneficial too, because the plant will put out more roots higher up its stem. These and



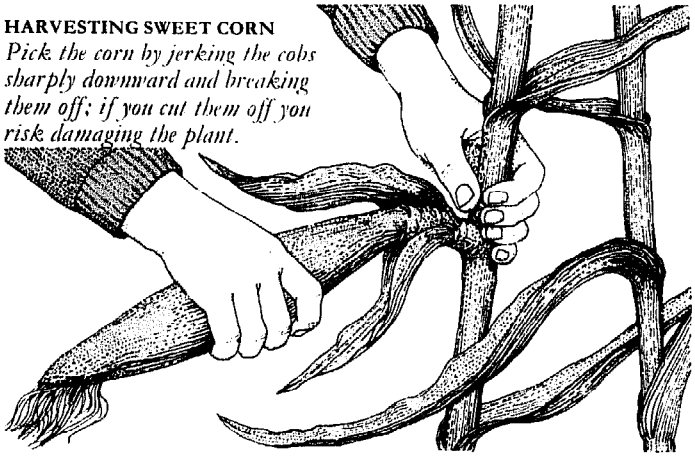
HILLING UP SWEET CORN
*If you intend to hill up your sweet corn stalks while they are growing, sow the seed 18 inches (45 cm) apart instead of 12 inches (30 cm) apart. Pulling up the soil around the plants in this way gives them support while they mature and causes them to put out more roots higher up.*

the soil help protect it against storms. If stems get broken, pull them upright and bank soil around them.

### Pests and diseases

***Earworm*** These bore into the tips of the ears of corn. If you see them when you are picking the ears, destroy them.
***Smut*** Smut is a fungus which causes large gray boils to appear on the kernels. Burn the affected plants and don't leave rotting sweet corn about on the ground; bury it or compost it. Otherwise it may develop smut.
***Corn borer*** This flesh-coloured, black-spotted worm breaks the tassels. If it is troublesome, destroy the plants after harvest.

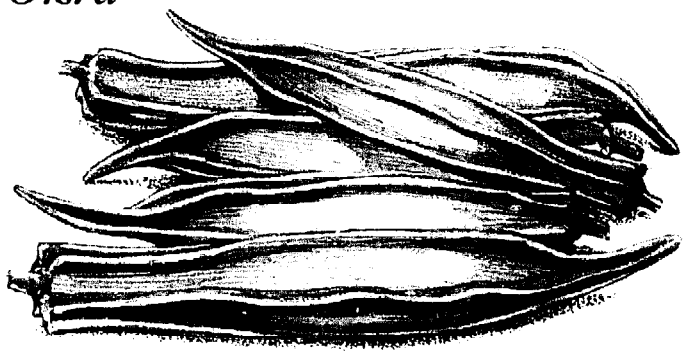
HARVESTING SWEET CORN
*Pick the corn by jerking the cobs sharply downward and breaking them off; if you cut them off you risk damaging the plant.*



### Harvesting

The ears are ready to pick as soon as the white, silky tassels go brown; otherwise test for ripeness by opening the husk and pressing your fingernail into a grain. If it is firm but still milky it is ready. Rush the corn to a pot of boiling water! The moment you pick it the sugar starts turning to starch and the flavor is lost.

## *Okra*



Okra, sometimes known as "gumbo", is a tropical vegetable, of the *Malvaceae*, or mallow family, whose most renowned member is the cotton plant. The pods of the okra plant make the most delicious vegetable with a very subtle and distinctive taste. They are much used in curries. When the seeds are well developed they can be shelled and cooked like peas. The whole plant is extremely attractive with large yellow and red flowers. Three or four plants will keep a family well supplied with okra.

### Soil and climate

Okra can be grown in greenhouses in cold climates. Outdoors it needs a lot of summer sun, and it is not much good trying to grow it in places with cool cloudy summers. But where outdoor tomatoes really thrive and crop reliably, okra can be grown. It likes a light soil with plenty of humus but not too much fresh manure, since this will produce too much leaf and not enough fruit.

### Soil treatment

Okra grows especially well by the deep bed method (see p. 106) and in cooler climates can be grown under portable deep bed mini-greenhouses (see p. 108). Otherwise cultivate deeply and work in some well-rotted compost. The soil should have a pH between 6 and 7.

### Propagation

Okra can be started indoors, but only in peat pots because it doesn't like being transplanted. If you sow the seed outdoors, wait until the soil is thoroughly warm. You can help here by warming the soil yourself under a mini-greenhouse or under cloches (see p. 96). Dwarf varieties should be sown 30 inches (75 cm) apart; larger varieties three and a half feet (1 m) apart.

### Care while growing

Okra should be watered occasionally, but not swamped.

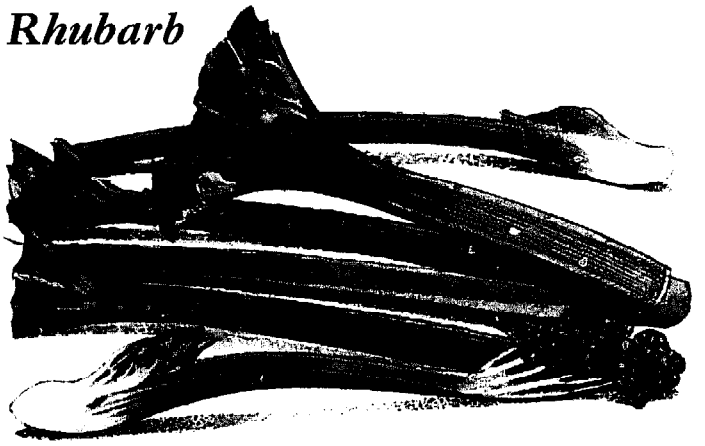
### Pests and diseases

***Caterpillars*** Pick caterpillars off and tread on them.

### Harvesting and storing

You can harvest about two months after sowing. Harvest when the okra is still quite young, a few days after the flowers have fallen. Pick pods every other day whether you need them or not, so that the plants keep producing more. Pods can be frozen or canned, and in Italy I have seen them laid out on a rack in the sun and dried. They keep well like this, but I prefer them fresh. Keep picking them as long as they grow, which can be right up to the first frost.

# *Rhubarb*



Rhubarb is a vegetable because we eat its stems, not its fruit. It is thought of as fruit merely because our whim is to eat it as a dessert, like most other fruit. These days there is so much fruit available, fresh or frozen, through the year, that there is no longer an endless gap between the last of the stored apples and the ripening of the raspberries. In the old days that gap was filled with rhubarb. But rhubarb is still well worth growing, for it is a good fruit substitute. Its stems contain oxalic acid, which scours pans clean and sets your teeth on edge

## Soil and climate

Rhubarb likes a cold climate (it comes from Mongolia) and is no good at all in a hot one. Unless it enjoys frost in the winter it does not have the dormant period which it needs, and its stalks, instead of being red and edible, are green and inedible. It likes quite acid soil so don't give it lime, but otherwise it will grow in any well-drained soil, and it seems to thrive in that milieu of nettles, old rusty cans, and broken bottles that is found at the bottom of many gardens.

## Soil treatment

Put rhubarb in a part of the garden devoted to perennials because, properly treated, it will continue to grow and yield for years. Clear its bed of perennial weeds, dig it deeply, and put plenty of manure on it. It pays to dig a deep pit, discard the subsoil, and fill in with manure and topsoil.

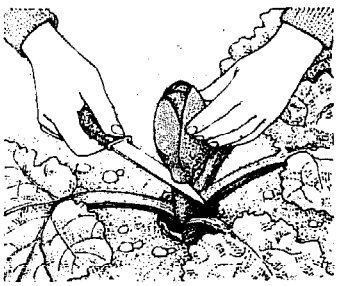
**PLANTING RHUBARB CROWNS**
*It is possible to raise rhubarb from seed, but this is not the most reliable method of growing it. It is best to get hold of some rooted crowns. Dig a deep hole, fill it with compost, put back the topsoil and plant the roots, right way up and three feet (90 cm) apart. They are sure to grow.*

## Propagation

Rhubarb seldom breeds true with seed, and so the usual method is to use divided roots. Commercial growers generally dig up their beds every four years, divide the roots, and replant on fresh ground. You can either buy root cuttings or get them from a neighbor who is in the process of dividing his rhubarb. Just plant the bits of root the right way up three feet (90 cm) apart, and up the plants will come. Nothing can stop them.

## Care while growing

Plentiful mulching is good for rhubarb. In the winter, when it dies down, you can bury it deeply in a mulch of manure, leaf-mold, compost or what you will. As long as it is provided with ample organic matter in this way you need not dig it up every four years: it will last almost indefinitely.



**CUTTING OFF FLOWERS**
*Flowering rhubarb will not produce succulent juicy stems. The flower stalks divert all the nourishment away from the plant: cut them off when they appear.*

In the spring draw the mulch away from around the plants to let the sun warm the soil. Then, when the plants begin to grow well, you can cover them with old buckets and in the winter, cover the buckets with fresh long-strawed manure, so that the heat from the manure will force the rhubarb on, and you will get stems to eat early in the spring. You can cover the crowns with oil drums, painted black to absorb the heat of the sun, open at the bottom end, and with a six inch (15 cm) diameter hole cut in the top. The oil drums should then be pressed firmly into the ground around the plants; they should be adequately weighed down to prevent them from blowing over.

## Pests and diseases

***Rhubarb curculio*** This is a colored beetle about an inch (2.5 cm) long. It bores into every part of the plant, especially the edible stalks, but can easily be picked off. The beetle lives in dock plants, so do not permit docks to exist near rhubarb.

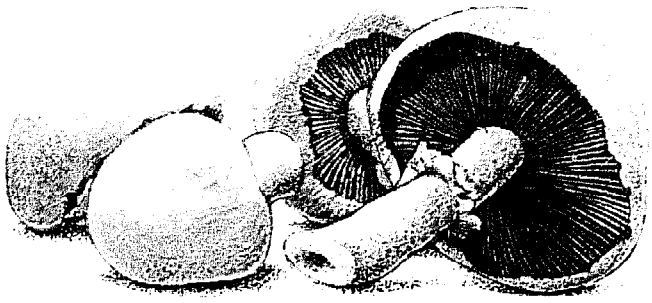
**FORCING RHUBARB**
*Cover each plant with an old bucket, and when winter comes insulate the bucket with long-strawed manure. If you lift two-year-old roots in late autumn and force them indoors, you can have rhubarb to eat through the winter. Otherwise start forcing the plants in the same way outdoors in very late winter, and you will reap the benefits in early summer.*

## Harvesting

Spare the plants altogether for their first year, and thereafter only harvest the big thick stalks: let the thinner ones grow on to nourish the plants. Never take more than half the stems of a plant in one year. Don't cut the stems, as this lets in rot; break them by pulling them back from the plant, then forcing them downward and inch or two. This does not hurt the crown. Stop harvesting altogether in July.

You can make jam with rhubarb (see p. 222) but the best thing you can do with it is to make wine (see p. 224).

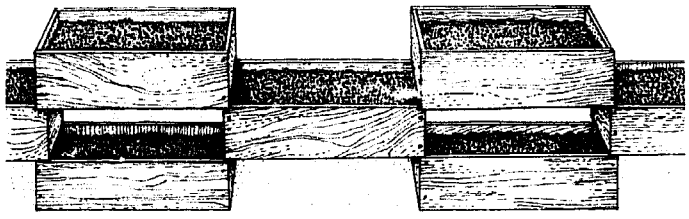
# *Mushrooms*



Mushrooms, which are fungi and not vegetables at all, are an obvious choice for the self-sufficient gardener who has space to spare indoors. Mushrooms have a higher mineral content than meat (twice as high as any other vegetable), and contain more protein than any other vegetable except for certain types of bean. Another good thing about growing mushrooms is that the compost you need for growing them can all end up in your garden outside.

## Climate

In warm weather you can grow mushrooms outdoors or indoors without artificial heating, using the method I shall describe. In the winter keep the temperature over 60°F (16°C). Never leave mushrooms in direct sunlight.



**STACKING MUSHROOMS IN BOXES**
*Allow at least six inches (15 cm) between the top of one box and the bottom of another. There should also be perhaps a dozen half inch (1.5 cm) holes in the bottom of each box. I like cedarwood boxes best, but you can use fiberglass trays.*

## Soil treatment

To grow mushrooms you need boxes which ideally should be two and a half feet (75 cm) long, nine inches (25 cm) wide and nine inches (25 cm) deep.

You can buy suitable compost and this is really the best thing to do for small quantities. However, to make enough compost for 60 square feet (6 sq m) is not difficult. Get four bales of wheat straw (no other straw will do) and shake it out into layers, soaking it thoroughly with water. Leave it for a day or two, but throw on more water from time to time, because it must be saturated. You should also have: seven pounds (3 kg) of gypsum (from a builder), 28 lbs (12.7 kg) of poultry manure, 14 lbs (6.3 kg) of mushroom compost activator.

When the straw is thoroughly wet, spread some out 12 inches (30 cm) deep over an area five feet (1.5 m) square. Shake over this layer a trowelful each of the poultry manure, gypsum and activator. Add another foot (30 cm) of straw and on this another sprinkling of the other goodies, until all the materials have been used up. The heap should be about six feet (1.8 m) high. If it is out of doors cover it with an old carpet, paper, or plastic.

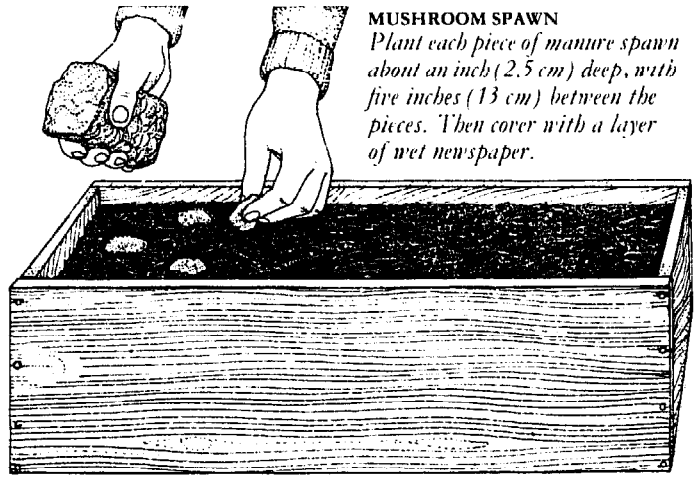
By the fourth day the temperature of the heap should be 160°F (71°C). Leave it another two days and then turn it so that the outsides are in the middle. If any part of the heap appears dry at this turning sprinkle water on it, just enough to moisten it but not enough to wash away the special ingredients. When you turn the heap, shake out the straw thoroughly and rebuild very carefully. The success of your crop depends on this care.

After another six days turn again. Be even more sparing with water, but if there are any dry patches or gray patches, sprinkle them lightly. Then, after four more days, turn yet again. If the compost appears too damp apply more gypsum. Six days later the compost will be ready for the boxes.

## Propagation

When it is ready for use, the compost should be fairly dry and springy; it should consist of short pieces of rotted straw but should not be sticky. Fill each box, tamping the compost down well with a brick, until the final topping up is level with the top of the box.

By now you will have bought some spawn. There is "manure" spawn which comes in lumps which you break into small pieces, and "grain" spawn which you simply scatter on the compost. I suggest that beginners use manure spawn, because it is easy to use and reliable.



**MUSHROOM SPAWN**
*Plant each piece of manure spawn about an inch (2.5 cm) deep, with five inches (13 cm) between the pieces. Then cover with a layer of wet newspaper.*

## Care while growing

During the next week or two, do not let the temperature fall below 60°F (16°C); 70°F (21°C) is even better. On the other hand beware of overheating; 90°F (32°C) may kill the spawn. After three weeks you should see the white threads of the mycelium growing in the compost. At this point you must apply "casing". Mix some well moistened horticultural peat with the same bulk of freshly sterilized loam (the loam should be from permanent grassland). Put an inch and a half (4 cm) layer of mixed peat and loam on top of the compost and press it down gently. Mushrooms should appear about three weeks later. Give them a little water. Keep the temperature between 60°F (16°C) and 64°F (18°C).

## Harvesting

When you harvest mushrooms twist them out. When the crop seems over, try and persuade it to go on cropping a little longer by watering it with a dilute salt solution. Eventually dump the spent compost on your compost heap, wash the boxes with formaldehyde solution, and put the boxes out to weather for several weeks before you use them again.

CHAPTER SIX

# The Cultivation of Fruits

*Containing the planting, growing and harvesting instructions for members of the families Rosaceae, Rutaceae, Grossulariaceae, Moraceae, Ericaceae, Oleaceae and Vitaceae.*

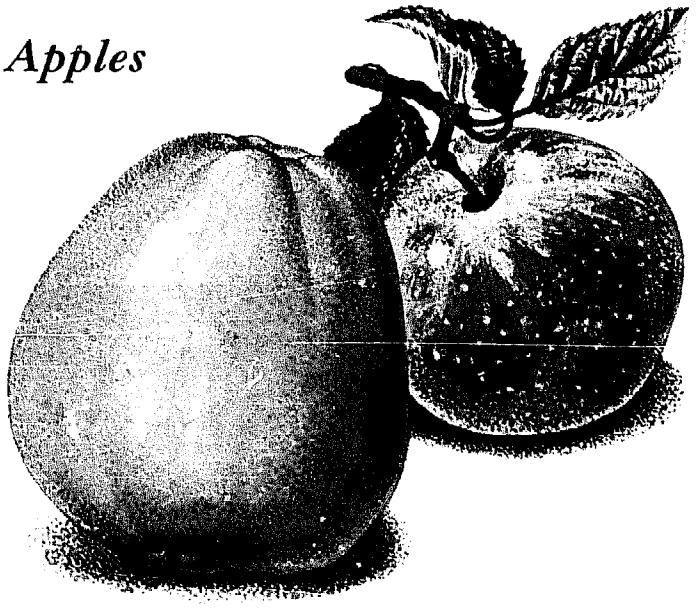
# *Rosaceae*

*Apples, pears, quinces, cherries, peaches, nectarines, apricots, plums, damsons, raspberries, blackberries and strawberries,* all belong to the useful and beautiful family of the *Rosaceae*. It is a huge family which includes agrimony, burnet, mountain ash, 500 species of hawthorn and, of course, the mighty rose.

Most of the fruits grown in temperate climates belong to this family, which splits into several subdivisions: among them are plants which have stone fruit like cherries and plums, those which have berries like strawberries and raspberries, and these which have what botanists call pomes like apples and pears.

All the species are insect-pollinated, which is why they have such enticing flowers. They also depend on birds and animals to scatter their seed – suitably manured – which is why they have attractive and edible fruits. And so, with the help of other living things, the cycle renews itself, and the *Rosaceae* continue to enhance our lives.

## *Apples*

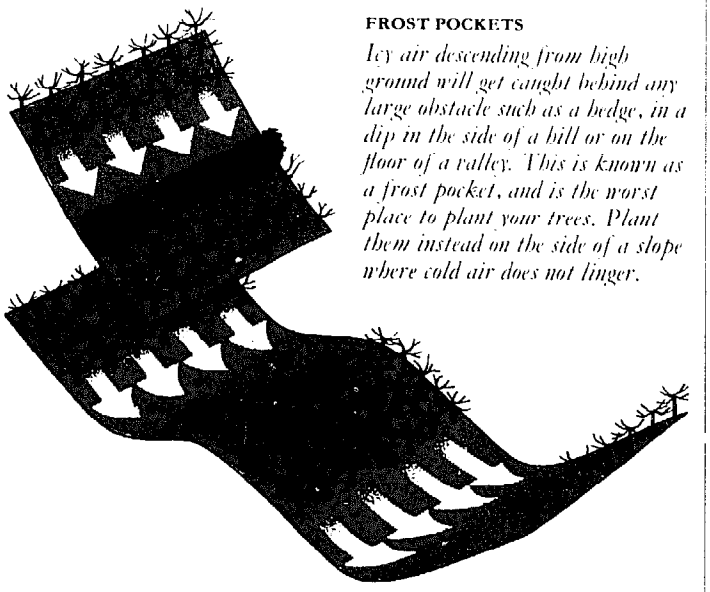


Apples are far and away the most important tree fruit crop of temperate climates. If you grow early and late varieties and a variety bred for keeping, you should have apples to eat throughout the year. The gap will come in the summer when you should have plenty of soft fruit. How many trees you should have and whether they should be standard, semi-dwarf, dwarf, espalier or cordon is discussed on page 76. A single apple tree will not fruit by itself; you must plant two or more different varieties to ensure fruit production.

### Soil and climate

Apples prefer a good, deep, well-drained loam, though they will do well on a heavy loam. They do not thrive on gravels, very sandy soils, heavy stubborn clays or on shallow soils above chalk or limestone. But, if you have unsuitable soil you can always dig a big pit where you want to plant a tree and bring in some good topsoil from outside. And of course any soil can be improved — be it too light or too heavy — with plenty of compost or manure.

In places where figs, citrus fruit, dates and such warm-climate things grow well and freely out of doors it is better not to grow apples. The apple is a cold climate tree and does better for a period of winter dormancy. It doesn't mind very cold winters (certain varieties will even grow in Alaska) but it doesn't like late frosts once it is in blossom. Late frosts are generally the sort that creep over the land on a still, clear night. Therefore take care not to plant apples in frost pockets – those places where cold frosty air gets trapped after it has flowed down from high ground. The floors of valleys and dips in the sides of hills – especially if they contain some obstruction, such as a thick hedge – are likely to be frost pockets. If your land is not flat, plant your apple trees fairly high on the side of a hill, or on a gentle rise, where cold air will not linger. But don't plant them where it is too windy.



**FROST POCKETS**

*Icy air descending from high ground will get caught behind any large obstacle such as a hedge, in a dip in the side of a hill or on the floor of a valley. This is known as a frost pocket, and is the worst place to plant your trees. Plant them instead on the side of a slope where cold air does not linger.*

### Soil treatment

It is a good thing to clear-cultivate land – thoroughly dig it over – before you plant fruit trees on it. Ideally after clear-cultivating you should grow a crop or two of green manure (see p. 86) and dig, plow, or till this into the soil. But you may be in too much of a hurry to do this – I always am – in which case simply clear-cultivating is perfectly adequate. It improves drainage and kills perennial weeds. Firm the soil well after digging by rolling or treading it. Then leave it for two weeks to settle. Make absolutely sure the land is well drained.

If you have heavy land, be very careful. You might easily dig a hole for a fruit tree, fill it with magnificent free-draining loam and compost, and find that you have done nothing more than dig a pond. Water sinks freely into the loam, fills the hole, then cannot get away because of the surrounding clay, and the tree dies for lack of air to its roots. You can get round this problem by filling the bottom foot (30 cm) of your hole with loose stones and then laying a line of drain pipes to connect each hole to a ditch or a low-lying piece of ground. Such an arrangement will enable the water to run away.

Soil should be around neutral for apples, about pH 7. So if your soil is acid, lime it. But take care not to make it too

alkaline, for although stone fruit trees need plenty of lime, apples don't like too much.

### Propagation

Most varieties of fruit tree will not breed true from seed. Seeds are the product of sexual reproduction and therefore each seed will have characteristics of both father and mother in it. To establish new varieties you have to grow trees from seed (indeed there is no other way), but once you have found a good variety the only way to reproduce it faithfully is by vegetative, rather than sexual reproduction. In other words you use hard wood cuttings instead of seed.

Unless you are interested in the propagation of fruit trees for its own sake, it is best to buy them from a nursery. Most of the fruit trees that you buy will consist of two different cultivars, or varieties, of the same species of tree grafted together. Nurserymen select root stocks for such qualities as hardiness and degree of vigor, (vigor to a nurseryman means the size of the tree when it is fully grown) and then select other varieties for good fruiting qualities, and graft the latter on top of the former. Planting a tree is described on page 98.

If you were to plant a Cox's orange pippin seed straight into the ground it would give you Cox's apples (that is if it survived at all), but the tree would not have anything like the hardiness and vigor that would result if you grafted a Cox on to the root stock of a crab apple tree. It is the root stock which decides the growth habit of the tree. So by employing dwarfing varieties as root stocks you can grow dwarf, or smaller, fruit trees than would grow from seed.

There is one organization that is eminent throughout the world for the breeding of new root stocks and that is the East Malling Research Station, in Kent, England. There thousands of new varieties of apples and pears are grown, and watched and evaluated, and successful ones are selected for widespread vegetative reproduction. All over the world apples and pears are grown on Malling root stocks.

You can plant pips to grow your own root stocks and cut your own "scions", which are healthy fruiting twigs of the current season's growth, usually about 18 inches (45 cm) long. You can then join the two together by grafting or budding. This is interesting to do if you have orchard space to spare, and it can be a profitable sideline. The techniques of grafting are described in detail on p. 99.

For many reasons dwarf apples trees are ideally suited to the home garden. First, one tree is not likely to produce more fruit than can be used during its season; second, an orchard of 15-20 dwarf trees can be grown in the space that one standard tree requires; third, dwarf apple trees that are well cared for, bear within two or three years of planting.

Plant standard apple trees 16 feet (5 m) apart. You can grow large trees in a circular deep bed (see p. 110); goblet or dwarf varieties thrive in an ordinary deep bed, six feet (1.8 m) apart, with other plants growing in between the trees and all along the side of the bed.

### Care while growing

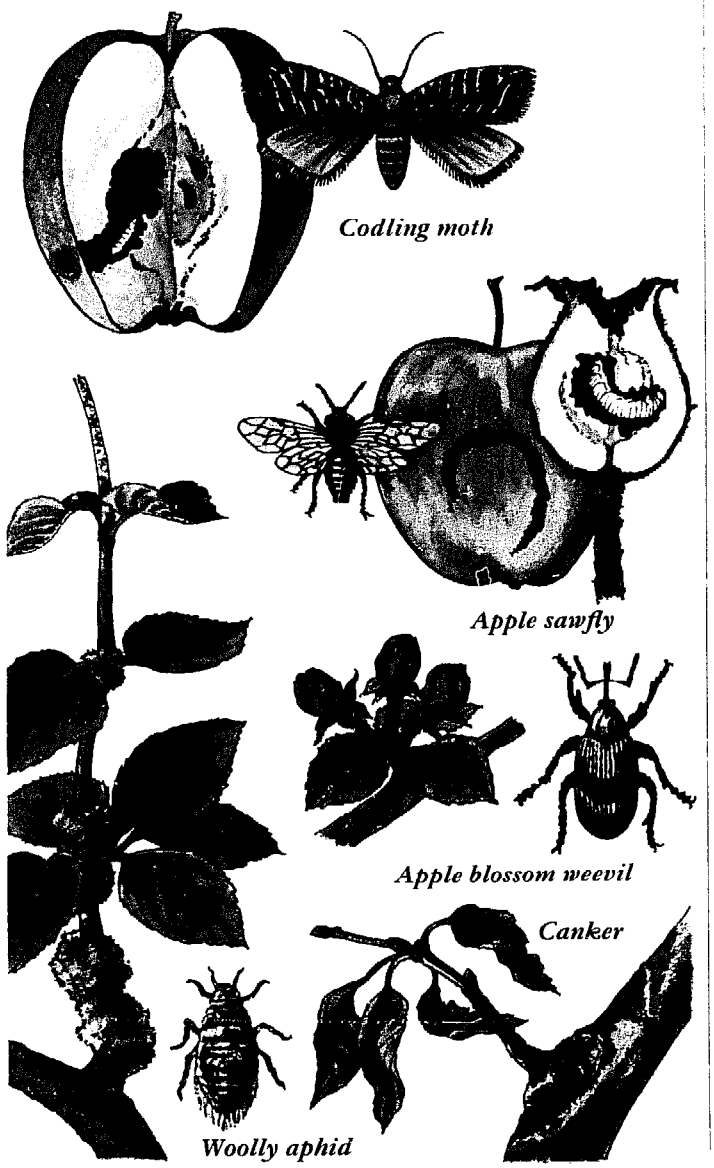
Maintain a mulch around the tree at all times. Bear in mind that mulches quickly disappear; the earthworms pull the organic material down into the soil where it rots and does a lot of good. So replace the mulch as often as necessary.

For the first four years of the tree's life keep the ground around it free of grass; in an orchard this means all the ground between the trees. You may well grow strawberries on this ground for these will not interfere with the nourishment of the apple trees. But the very best thing you can do for the young trees is to keep the ground clear-cultivated all summer, and then sow a winter green manure crop in the fall. A mixture of half winter rye and half winter vetch is ideal. Till, or dig this in shallowly in the spring.

***Pruning*** Pruning fruit trees is a science in itself, and the best way to learn about it is to watch an experienced pruner. The basic techniques are described on p. 100.

The idea of pruning is to shape the tree, and control the number of fruiting spurs so that you get plenty of good fruit and not too much inferior fruit. There are two main forms of pruning: winter pruning and summer pruning. They are quite different and have different purposes.

Winter pruning, which is principally to shape the tree, encourages growth but may delay fruiting: the more you prune a tree in winter the faster it will grow. But a tree putting all its energy into growing can't produce fruit. So once a tree has reached its adult size (usually after about four years for standards) restrict winter pruning to a minimum. Summer pruning, which consists of shortening the current year's growth, helps to stop the tree growing too fast or too big, and encourages earlier fruiting.



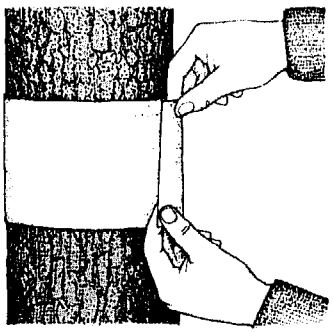
## Pests and diseases

Most commercial fruit-growers combat pests and diseases by constantly spraying with deadlier and deadlier fungicides and insecticides. The pests are poisoned, but so are their natural predators. As the pests build up a resistance to various pesticides, the pesticides have to be applied in larger and larger quantities: to spray twelve times in a season is not unusual.

My own belief is that a thorough spraying with a proprietary winter wash (see p. 104) in late winter, well before the buds even think of opening, is all the spraying you should need to do. But apart from spraying there are several other things you ought to do.

First and foremost, be hygienic. Do not leave prunings, dead dropped fruit or other rubbish lying on the ground. If you can't eat dropped fruit, put it on the compost heap. Burn all prunings. When the leaves fall leave them to be dragged down by the worms unless they have mildew on them, in which case you should burn them. Don't just leave diseased or cankered trees; pull them out and burn them.

If you have a lot of trouble with pests, wrap a band of paper, or cloth, covered in grease around the trunk of each tree. Any pests that walk up the trunks will get stuck.



**GREASE BANDING**
*There are various organic ways and means of keeping down pests, but if you find that you are still having a lot of trouble, you can cover a band of paper or cloth with grease and wrap it around each tree. All the pests walking up and down the trunks will get stuck and die.*

If you have hens, keep them under your fruit trees, because they eat a lot of harmful grubs. In midsummer carefully examine all your trees, remove any deformed or diseased fruit and put it on your compost heap.

***Mildew*** If your trees suffer from either downy or powdery mildew, which causes a whitish down on the leaves, then you should burn all the leaves when they fall in the autumn or put them right in the middle of a compost heap.

***Codling moths*** Codling moths lay their eggs on the blossom and eventually the caterpillars burrow into the fruit. The solution is to wrap corrugated paper or old sacking around the trunks and major branches in midsummer. The caterpillars will take refuge in these to pupate, and when they do so you can burn them in the autumn. In the old days people used to build bonfires in their orchards in midsummer simply so that the codling moths would fly into the flames.

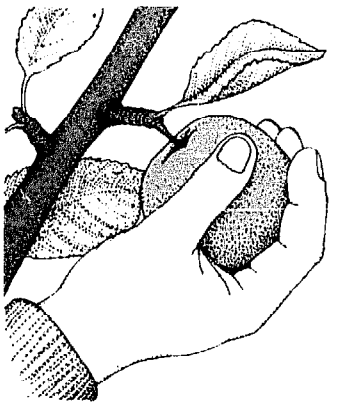
***Scab*** Scab is a fungus which makes brown patches on fruit. As long as the scabs are small they are not important. Winter washing and careful hygiene are the only cures.

***Apple sawfly*** Yellowish maggots tunnel into the fruit, sometimes leaving them completely inedible. This happens in late summer, and the apples are covered in ribbon-like scars. Trap the maggots at this time in glass jars, covered with screenwire with holes too small to admit bees. Fill the jars with water mixed with sugar, honey, treacle, or else molasses, and then hang them from the branches on the sunny sides of your trees.

***Woolly apple aphid*** Woolly apple aphid is an irritating pest which attacks apples and leaves, causing growths that look like cotton wool on the leaves. Painting such patches with methylated spirits will kill the grubs. You can also grow buckwheat near your fruit trees. This will attract hoverflies, which lay their eggs near the woolly aphid. When hatched the hoverfly will crawl under the "wool" and eat the aphid.

***Apple blossom weevil*** Apple blossom weevils lay their eggs in the blossom. This often causes the blossom to turn brown and die. The adult weevils eat the leaves. If you get these, put on the sacking or paper trap for codling moths a month early. It will then trap both pests.

***Canker*** Fruit trees are mainly attacked by canker in wet climates. Rot develops on branches or trunks. Prune off the affected branches and the affected parts of trunks down to the clean wood and paint the wounds.

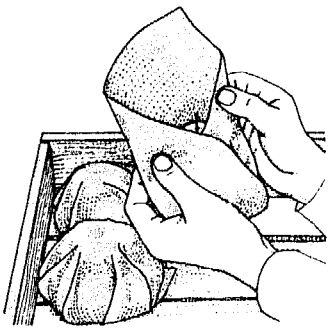


**PICKING APPLES**
*Don't bump or bruise apples in the process of picking them. The time to pick them is when they come off at once as you twist their stalks sharply upwards. Pick over the same tree several times if necessary, so that each apple is picked when it is just ripe.*

## Harvesting and storing

Summer, or early, apples should be picked and either eaten or preserved pretty fast. Late apples are the ones for storing.

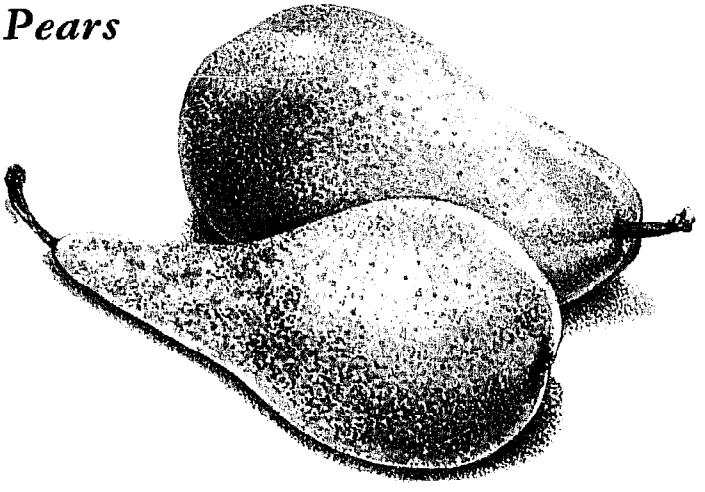
Don't try to store any damaged, unripe, or overripe fruit, or fruit from which the stalks have come out. A temperature of 40°F (4°C) is ideal for storage. Frost is fatal and so are excessively high temperatures. Ventilation must be good but not too vigorous; you don't want them in a draft. Too dry a place is also to be avoided; it is a good idea to throw water on the floor if the air seems too dry. Places with thick walls and stone, earth, or tiled floors are better than attics. Either lay the fruit out in a single layer so they are not touching each other, or better still wrap each fruit in newspaper or even oiled wraps. Don't store any fruit together with strong-smelling substances.



**STORING APPLES**
*Late apples are the ones to store. They should be kept in a well-ventilated room, free from drafts and very dry air. A temperature of 40°F (4°C) is ideal. The very best way of storing is to wrap each fruit in oiled paper, and place them in boxes or crates, in a single layer, not touching each other.*

A new way of storing both apples and pears is in thin polyethylene bags, and the apples need not be individually wrapped. Seal the bags and store them at an even temperature; 40°F (4°C) is ideal. Make pinholes in the bags, one for each pound of fruit stored inside.

# *Pears*



If you have space to spare after putting in three apple trees, a pear tree is a good fourth choice, but remember that most varieties need a partner nearby for pollination. The culture of pear trees is very similar to that of apple trees (see Apples), although pears are rather more fussy and they need extra care and attention.

### Soil and climate

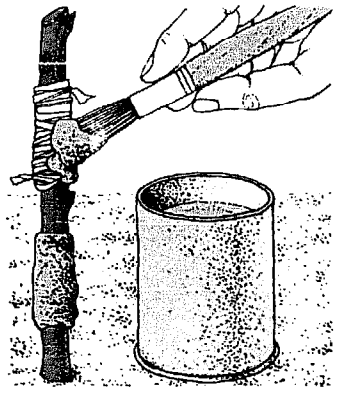
Pears suffer more from frosts than apples do, because they blossom earlier and the frost can kill or severely injure the blossom. They also need a dormant period in order to fruit. They prefer heavy soil, but it must be well drained.

### Soil treatment

Before planting any fruit tree you should clear-cultivate the soil (dig it over thoroughly), and pears are no exception to this rule. Soil should be around neutral, pH 6.5 to 7.5.

### Propagation

Pears will not breed true from seed. To produce trees which will fruit well and are also hardy and vigorous requires grafting (see p. 99). The difference between apples and pears is that pears sometimes have to be "double worked".



**"DOUBLE WORKING" PEARS**

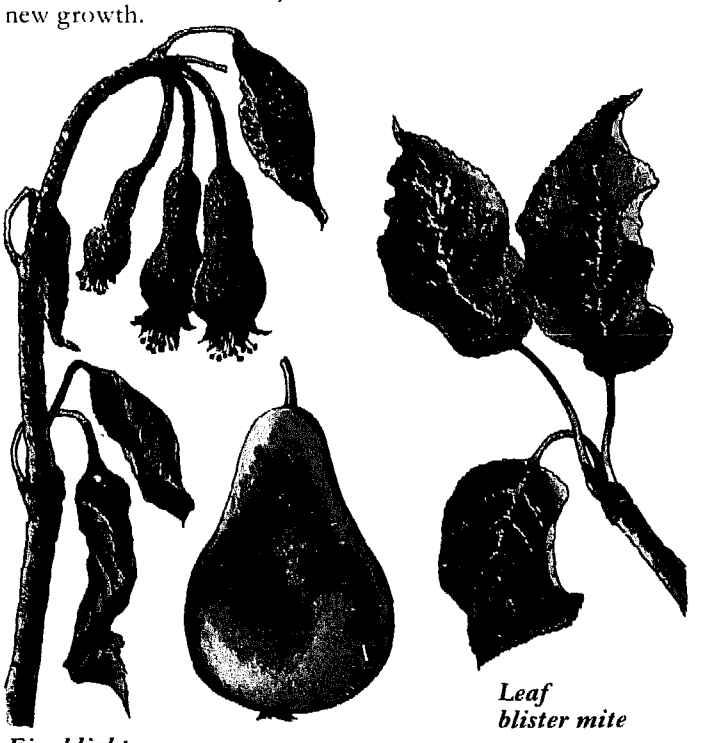
*Pears are generally planted on quince root stocks (the quince is closely related to the pear, but hardier and smaller). However, some varieties of pear will not take on quince root stock and must first be grafted on to a compatible pear variety, which is itself grafted on to the quince.*

East Malling Research Station (see p. 169) is a worldwide source of pear root stock. Malling Quince A is most commonly used. Malling Quince C is the best root stock if you want dwarf trees. Pears are often self-sterile and have to be planted with mutually fertilizing varieties. Plant pear trees in the way described on page 98. They can also be grown in a circular deep bed (see p. 110), or six feet (1.8 m) apart in an ordinary deep bed as long as they are kept small.

### Care while growing

Except that pears can bear heavier pruning than apples without being stimulated into rampant growth, the pruning procedure for apples and pears is identical (see Apples and p. 100). And tip-bearing pears should be treated like tip-bearing apples.

If a pear tree ceases to produce new growth – and this can happen in a tree that is still very much alive – cut back into two or even three-year-old wood in order to stimulate new growth.



***Fire blight***

***Leaf blister mite***

### Pests and diseases

Pears can get all the apple diseases and the same steps should be taken (see Apples). There are also some pests and diseases which are peculiar to pears:

***Fire blight*** This attacks at blossom time, causing the blooms to blacken and shrivel, and subsequently every part of the tree blackens as though it has been on fire. Cut out all affected parts at least six inches (15 cm) back from the site of infection with a sterilized knife and burn them immediately. It is important to disinfect the knife after making each cut. Several varieties of pear are resistant to fire blight.

***Leaf blister mite*** These tiny mites attack leaves in spring, causing green or red blisters to appear. Pick off and burn the leaves immediately.

***Phytophthora rot*** This is a disease caused by a fungus. Brown patches appear on the skin and the flesh rots. Burn all rotten fruit and spray with Burgundy mixture.

### Harvesting and storing

Pick pears a little before they are completely ripe, as soon as they come off the tree easily when you lift them away. Take exaggerated precautions not to bruise them. Store them like apples as near 30°F (−1°C) as possible, but before you eat them bring them into room temperature and wait for them to ripen. Eat them when they are slightly soft. There is one day in the life of every pear when it is perfect, and with pears, perfect is perfect.

# *Cherries*

It is only really worth planting a cherry tree if your garden or orchard fulfils two conditions. First, there must be ample space to spare after allowing for your vegetables, your soft fruit and your staple tree fruit – apples, pears and plums; a cherry tree can cover an enormous area of ground, often about 500 square feet (45 sq m). Secondly, your garden must be relatively free of birds. If it isn't, the birds will eat the lot in which case the best thing to do is grow your cherries against a wall and hang a net over them.

There are two kinds of cherries: sweet and sour. Generally speaking, sweet cherries are for eating fresh, and sour cherries are for cooking, canning and jam-making. Sour cherries have the advantages that they are less attractive to birds and can be grown anywhere in the garden, while sweet cherries need a sunny position or a south-facing wall. The "montmorency", which is a sour variety, is the best cherry to grow, because it is hardy and self-fertile.

## Soil and climate

Sweet cherries thrive on lightish well-drained loam. They even do quite well on gravelly soil, although they send their roots deep and need a good depth of soil beneath them. Sour cherries will do better on clay than sweet cherries will, but they also prefer light deep soil. Both sorts prefer a pH of 6 or 7, but will tolerate more lime than apples, so a pH of 8 will do. They will grow in temperate climates and there are even varieties which will fruit in very severe climates. The blossoms of most varieties, however, are frost tender and should not be grown in frost pockets (see p. 168).

## Soil treatment

Clear-cultivate the soil (that is, dig it thoroughly).

## Propagation

Cherry scions are mostly grafted on wild cherry root stock. The simplest thing is to buy the cherry tree you want, already grafted, but if you want to do your own grafting, the appropriate methods are described on p. 99. As nearly all cherries are not self-fertile, it is a good idea to have two varieties grafted on one tree. Choose varieties which flower at the same time. Sweet and sour will cross-pollinate. Plant the trees just like apple trees (see p. 98). In an orchard they should be 45 ft (13 m) apart. If cherries grow in a border up against a wall, it can be dug as a deep bed (see p. 106).

## Care while growing

Prune cherry trees as illustrated below. It is an advantage to apply material high in nitrogen – about an ounce (28 g) for each year of the tree's growth until it is five years old. Simply sprinkle it on the ground near the base of the tree. Thereafter apply five ounces (140 g) per year. One ounce (28 g) is found in one pound (500 g) of cottonseed meal or a half pound (225 g) of blood meal.

Keep the soil bare under cherry trees for the first five years, but don't dig deeply. Hoeing or mulching is sufficient. After the fifth year clear all weeds away, plant some daffodils, tulips and crocuses around the tree, grass the land down, and leave it. The other alternative is to run chickens under your cherry tree. If you do this make sure you have enough chickens to produce about 25 pounds (11 kg) of manure in a year.

## Pests and diseases

***Black cherry aphid*** These aphids cause severe leaf curl, which is sometimes accompanied by black patches on the leaves. If your cherry trees are badly affected spray with tar wash or Burgundy mixture (see p. 104).

***Silver leaf disease*** If left unchecked silver leaf disease may kill the tree. It is caused by a fungus which lives on dead wood, so you won't get it as long as you prune well in early summer and cover all wounds with paint.

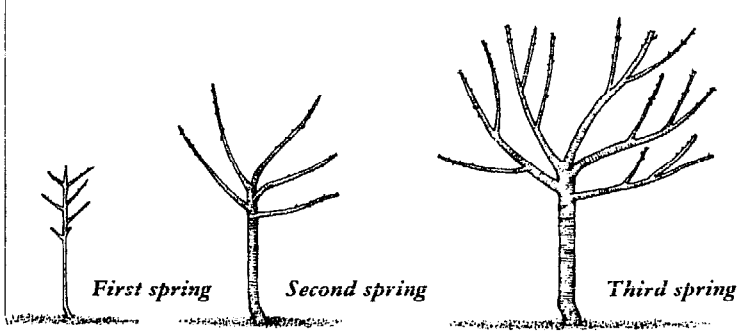
***Brown rot*** See Peaches and Apricots.

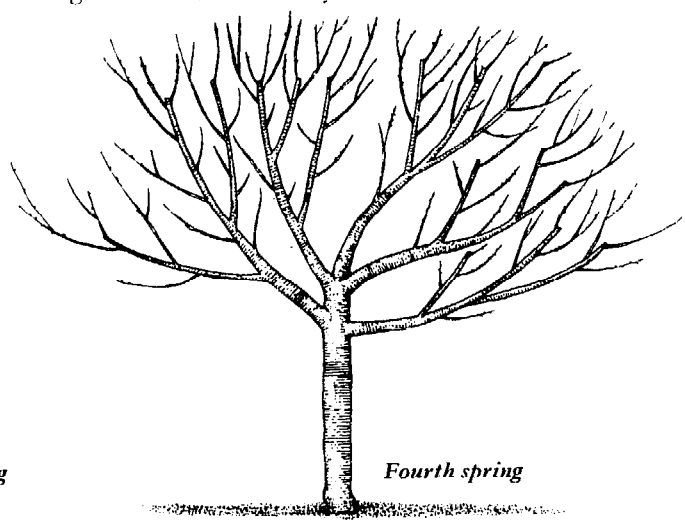
## Harvesting

Harvest sweet cherries when they are quite ripe and eat them immediately. With sour cherries pull the fruit off, leaving the stalks; otherwise you will tear the tree.

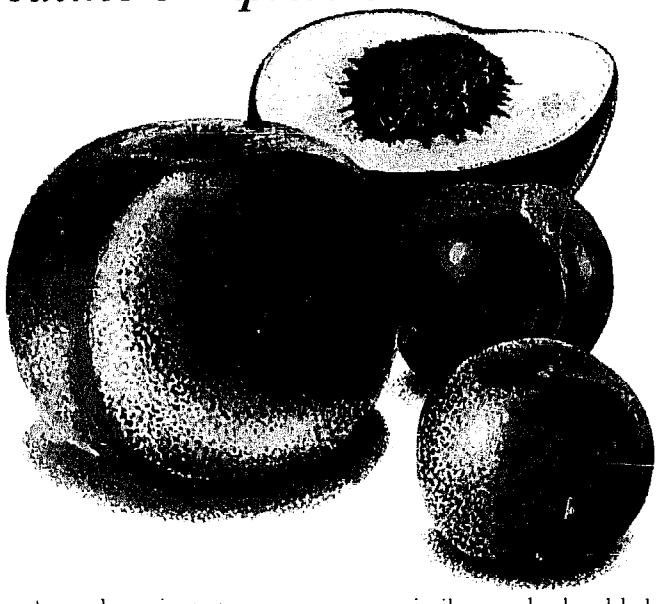
**PRUNING A CHERRY TREE**

*Start with a "maiden" tree. In the spring shorten all its branches by six inches (15 cm). The next spring cut out all main branches but five. A year later prune all but two secondary branches on each main branch. Every spring thereafter cut out all dead or inward-pointing branches.*



# *Peaches & Apricots*



Peach and apricot trees are very similar and should be grown in the same way; they share the same pests and diseases. Nectarines differ from peaches only because they have smooth skins; botanically they are identical.

### Soil and climate

Peaches and apricots will grow in sand, or a very sandy or gravelly soil, provided there is plenty of humus in it. They like a hot summer and a fairly cold winter. Ideally the winter temperature should go below 40°F (4°C) for some weeks to give them a dormant period, but it should not get too cold. However, peaches are grown as far north as Maine and as far south as northern Florida. Apricots can be grown even farther north but not as far south. Peach and apricot trees must have a sunny position and must not be grown in frost pockets (see p. 168). Land sloping down to a lake, river, or estuary is fine.

### Soil treatment

Dig the soil well and dig in plenty of humus, but not humus too rich in nitrogen. Too much nitrogen makes peach trees rampant, sappy and more susceptible to frost damage. Peat and leaf-mold are very good. A pH of 6 or over is ideal.

### Propagation

Plant peach trees in the early spring except in very mild climates, because cold weather could injure them in their first year. Choose a variety that is known to be suitable for your area (ask your local nurseryman), and plant the trees as you would apple trees (see p. 98). Peaches can be grown in a circular deep bed (see p. 110). You can buy peach trees ready grafted, or you can do your own grafting (see p. 99). Choose those recommended as of highest dessert quality; avoid those described as long keepers. Special hardy varieties of peach are now bred which do not need grafting.

### Care while growing

The fruit only grows on the previous year's wood and it is as well to remember this when pruning. When you plant a sapling, cut the tree back to about two feet (60 cm) above the ground, cutting just above a branch. Prune it hard again in the early summer; cut back all branches to within an inch (2.5 cm) of the trunk (not flush with it). New branches will sprout that first summer beside the stubs of the old ones. Rub off all of them except three, which will form the framework, or "scaffold", of the tree. Do this as soon as the tiny branches show themselves.

The aim now is either to let the most upright of the new branches go upward and make a trunk, or, better still, to let all three grow up and away from each other and form an upside-down tripod. All your subsequent pruning, which must be done each year in early summer, should maintain this shape. Cut out all inward-pointing shoots and cut back all shoots which have died at the tip, until you reach clean white wood with no brown in the middle. Protect all wounds meticulously with tree paint.

In cold climates give all peach trees nitrogen in the very early spring, about an ounce (28 g) for every year of the tree's growth. This controlled amount of nitrogen enables the tree to grow and fruit vigorously in the summer but to stop growing long before the freezing winter sets in when new sappy wood would suffer from frost. Give dressings of compost or manure, in late fall.

Fruit should be thinned so as to give one fruit every six to eight inches (25 cm) of wood. This is best done in two stages: in early summer thin to four inches (10 cm) apart and then, about four weeks later when the fruit is the size of a walnut, thin to nine inches (25 cm).

### Pests and diseases

***Peach leaf curl*** This is more common in northern states. Leaves curl and crinkle. Spray with Bordeaux mixture (see p. 105) in midwinter and again a month later. Spray once more in the autumn just before leaf fall.

***Leaf spot*** This is a bacterial disease which causes brown spots on the leaves, and it can be serious. If a tree gets it, give it plenty of manure and it should get over it.

***Brown rot*** This is a serious fungus disease that affects all the stone fruits. Leaves turn brown and often fruits become

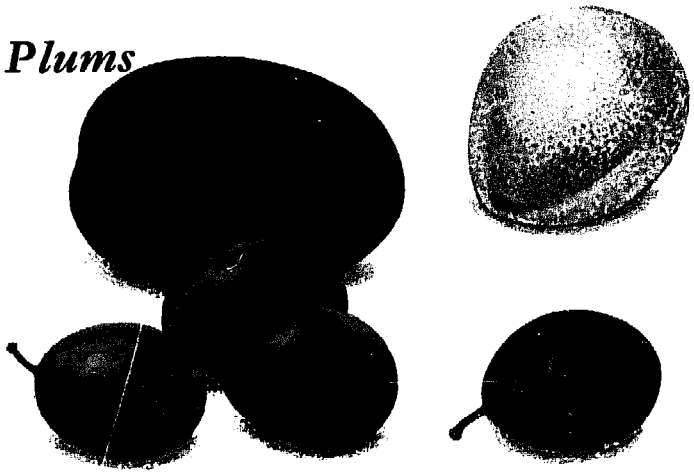
***Peach leaf curl***

covered with soft brown spots which produce white spores. Branches may develop sticky conkers. Cut out and burn all infected branches.

### Harvesting and storing

When peaches have turned yellow and are slightly soft to gentle pressure, it is time to pick. Turn the fruit slightly and it will come off. It can be stored for up to two weeks in a cool cellar or it can be frozen (see p. 227) or canned (see p. 220). Apricots should be picked and eaten when soft and ripe, or they can be picked a little earlier when still firm, and then dried. To dry them split the fruit in two and remove the stones. Leave them in trays in the sun, split side up, for up to three days.

# *Plums*



Plums of three types are commonly grown: European, Japanese and native American plums. They are all fairly hardy, don't get many diseases and yield very heavily in some years.

### Soil and climate

European plums like deep soil, and will flourish in deep loams or clays as long as they are well drained, but they do not thrive in dry, shallow soils. Japanese and American kinds are more tolerant of shallow soils. Plums flower early and are therefore susceptible to spring frosts, so don't plant them in a frost pocket (see p. 168). Like other temperate climate fruits, plums need to lie dormant through a cold winter.

### Soil treatment

A neutral soil is best, around pH 7, so lime if your soil is acid. Clear-cultivate (thoroughly dig) the land before planting plums, and then, ideally, grow a crop, or even two crops, of green manure. Dig, or till these into the soil. The land must be well drained. If it is not, fill the bottom foot (30 cm) of the hole you dig for each tree with stones, and bury a line of drain pipes to lead the water away to a ditch or lower piece of ground.

### Propagation

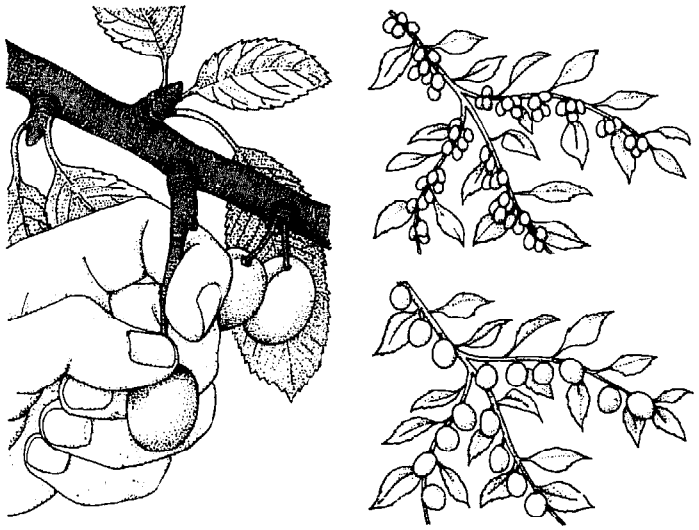
Plums should always be grafted (see p. 99), and nearly always will be if you buy from a nursery. Plant plum trees as you would apple trees (see p. 98). Most plums are not self-pollinating, so you must plant at least two, and preferably several, compatible varieties. Japanese plums cannot pollinate European plums, or *vice versa*. Native American varieties are pollinated by other native varieties, or by certain hybrids. American-Japanese hybrids can be pollinated by Japanese varieties. You must get advice from your nurseryman on this. Allow 24 feet (7 m) between standard trees and 15 feet (4.5 m), between trees planted on semi-dwarfing stock. Plums can be planted in the circular deep bed (see p. 110). Plant plum trees in early winter; but in areas with exceptionally cold winters plant in early spring.

### Care while growing

Plums benefit from quite rich feeding. It is an advantage to have hens or other poultry running under them. Otherwise apply heavy dressings of compost, stable or cow manure.

***Pruning*** Plums can be pruned to form all the tree shapes described on p. 100. Prune when you first plant the tree, and thereafter confine pruning to early summer only, because silver leaf disease may develop if you prune in winter.

In some years plum trees bear a considerable weight of fruit, and because their branches tend to be quite slender, those which carry a lot of fruit may need support. There are two ways of doing this. You can build a T-shaped wooden scaffold which should be firmly rooted in the ground next to the trunk and secured to it with a plastic strap. Ropes from the top of the "T" can be tied round the drooping branches. The other solution is to use a forked branch as a support. Protect the branch with sacking to save it from chafing.



**THINNING PLUMS**

*If your crop is allowed to become too heavy the plums may be small and tasteless. Therefore you should thin, when the plums reach about half their final size. Don't pick off the stalk when you pinch off the fruit. Leave at least two or three inches (5-8 cm) between remaining plums.*

### Pests and diseases

Plums suffer from the same pests and diseases as apples (see Apples), as well as a few of their own.

***Silver leaf disease*** The symptom of this is silvering of the leaves, but the disease attacks and can kill the whole tree. It is caused by a fungus which grows in dead wood. As long as you rigorously prune out all dead wood in early summer, burn the prunings and cover the wounds with paint, your trees won't suffer from silver leaf.

***Bacterial blight*** This shows first as black streaks on the young shoots. Later on black spots appear on leaves and fruit which become inedible. There is no cure for this, beyond the pruning and burning of all diseased wood. Some varieties are more resistant to this than others.

***Heart rot*** Leaving sawn-off stumps of branches on a tree can cause heart rot; the stumps heal slowly, so bacteria can get in and kill the wood under the bark. You won't get it if you cut all branches flush with the trunk.

***Brown rot*** See Peaches and Apricots.

### Harvesting and storing

For jam or jelly, or for canning (which suits plums admirably) pick the fruit as soon as the bloom appears on their skins, but before they get soft. For eating fresh pick them when quite ripe, which is when they give a little and come easily off the tree. In hot dry climates plums to be turned into prunes can be left on the tree until they are quite dry and ready to be shaken off. They should then be dried in the sun on trays. In damp climates they can be dried artificially (see p. 216).

# Quinces

Quinces are so closely related to apples and pears that the latter are often grafted on to quince stock, because quince stock is hardy and produces small trees. Quinces are not grown as much as they should be; they have a very special and delicate flavor and quince jelly is one of the world's great gastronomic experiences. They are self-fruitful.

### Soil and climate

Quinces will grow in any soil or climate that apples will (see Apples), although they are a little more tender. They prefer a warm summer and a fairly cold winter. Heavy soil suits them best, but it must be well drained.

### Soil treatment

Dig the land thoroughly, and if you are not in a hurry, grow and dig in one or two crops of green manure. The soil should be neutral, pH 7. Quinces don't like too much nitrogen but need phosphate and potash.

### Propagation

If you don't buy a seedling from a nursery, the best way to propagate is from cuttings made from the suckers which quinces throw out every year. In the autumn cut lengths about nine inches (23 cm) long, and bury two thirds of their length in sandy soil. After a year move these to their permanent positions.

### Care while growing

You can prune quinces to all the tree shapes (see p. 100) or you can leave them strictly alone, in which case you will get a spreading bush shape. Quinces are not prone to being attacked by pests and diseases.

### Harvesting and storing

You can leave the fruit on the tree until after the first hard frost. Then make jelly (see p. 223) right away, or if you don't have time to make jelly immediately you can store the quinces in cool moist conditions for up to three months.

## MEDLARS

Medlars are hardier than quinces and can therefore cope with colder conditions. They do best if they are grafted (see p. 99) on to thorn, pear or quince root stock. Otherwise treat them like quinces. The fruit is unusual in that its five seeds are visible and it is only edible – and it is actually very good to eat – when it is half rotten.

# Raspberries

Raspberries are one of the best soft fruit crops the self-sufficient gardener can grow. They are hardy, and will stand neglect, although they shouldn't have to. They are easy to grow, self-fruitful and heavy yielding.

### Soil and climate

They prefer the soil to be slightly acid, so do not lime under any circumstances. Lime can cause chlorosis (yellowing of the leaves). They do need good soil though, so if your soil is light and sandy, put in plenty of manure. Raspberries prefer sun, but if you have a garden where sun is at a premium, grow your raspberries in a shady area. They will stand colder climates than most other fruits.

### Soil treatment

In the fall dig a trench two spade-depths deep and fill it with soil mixed with compost or manure. They need a lot of potash, so incorporate wood ashes with the soil if you have any; otherwise mix in some other potash fertilizer. They have both shallow and deep roots, and need a lot of humus.

If you want only one row you have no problem: but the roots spread far and wide so if you want more than one row then have them quite far apart: six feet (1.8 m) is usual in commercial gardens but four feet (1.2 m) will do if you are trying to save space.

**PROPAGATING RASPBERRIES**

*Like strawberries, raspberries propagate by "walking". Raspberries "walk" by pushing out roots which send up suckers to form new plants. Just let your plants send up suckers, cut off the roots connecting them to the parent plant with your spade, then lift the suckers and re-plant them.*

### Propagation

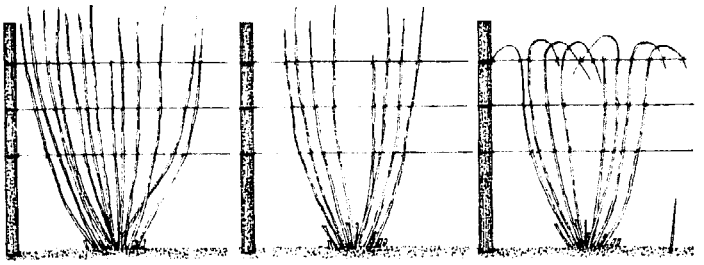
Different varieties will give you fruit from midsummer till hard frost. I strongly advise you to buy stock certified to be virus-free. Such plants will give higher yields and last far longer than the plants your neighbor offers you when he has to get rid of his suckers in the fall. The certified plants you get will consist of one cane, or whip, with a heel of root attached to it. Plant roots a foot (30 cm) apart in rows four feet (1.2 m) apart. Put the root down about three inches (8 cm), cover with soil, and firm well. Immediately cut the cane down to nine inches (23 cm) above the ground.

There is no reason why you should not then multiply your own raspberry plants in subsequent years. Like strawberries, raspberries "walk", but they do it in a totally different way. In the deep bed (see p. 106) raspberries should be planted in three rows with 18 inches (45 cm) between the

rows. Their shallow roots make intercropping inadvisable. Don't plant raspberries where raspberries have been before. Don't plant them immediately after potatoes or tomatoes either, for these plants get some of the same diseases.

### Care while growing

Don't let them fruit the first summer: remove the blossoms, otherwise the plant will be weakened by fruiting. By the second summer they should bear well. Keep weeds down near the plants by heavy mulching – say within a foot (30 cm) of them. Grass cuttings, leaves or compost are all good. Hoe between the rows. Don't allow grass or weeds to establish themselves; raspberries will not flourish in grass. So be sure that the mulch is thick enough every spring. The raspberry rows are a good repository for wood ashes.



PRUNING RASPBERRY CANES

*After cutting out all the old wood thin the new canes, leaving only the best six or eight to fruit the next summer. When these grow over the top of the top wire, shorten them to six inches (15 cm) above it; or else bend them over in an inverted "U" shape and tie them to the wire.*

Training is simple but necessary. You must have a fence, with three wires, the top one five feet (1.5 m) from the ground, the others at regular intervals below it. Tie the canes to these. Some people have three pairs of wires and simply shove the canes in between each pair. This works, but individual tying is better.

***Pruning*** In the fall, after the leaves have died off, cut off all the canes which have fruited close to the ground and prune as shown above.

Remember that raspberries act like biennials, although actually of course they are perennials. The wood made in one year fruits the next and then dies down. So cut out the wood that has fruited every year and keep the wood that grew that year, because that will fruit the next.

### Pests and diseases

There are several virus and fungoid diseases that raspberries get. If you see any discoloration or other sign of disease cut out and burn the affected part.

***Mosaic disease*** This is the worst of various virus diseases and makes the leaves curl and show red and yellow mottling. Dig the bushes that have got this right out and burn them. If you don't, aphids will spread the virus to other plants.

***Iron deficiency*** If you see yellowing between the veins of the leaves suspect iron deficiency. This is especially likely if you have very alkaline soil.

### Harvesting and storing

Eat as many as you can ripe and raw with cream. Store the rest; they freeze well (see p. 227) and can well (see p. 220). When rain falls on ripe fruit, pick the fruit immediately the rain stops and can or freeze it; if you don't the raspberries will go moldy. Don't leave moldy fruit on canes, because the mold will spread to the others.

## *Blackberries*

In most temperate parts of the world wild blackberries grow nearly everywhere and it is fun hunting for them. Nevertheless, for a regular supply it is worth keeping a few bushes.

### Soil and climate

There are several species of blackberry, and cultivated varieties have been developed from them that will grow happily in every climate from the very coldest temperate region to the sub-tropics. They prefer rich, well-drained soil (pH 7), and a sheltered site.

### Propagation

You can propagate blackberries from cuttings, suckers, by layering (see p. 95), or by division of roots – digging up a piece of plant with roots on it, and replanting. The simplest method of all is to propagate from tip cuttings – cut the tip off a cane, push it into the ground and it will root. Wrap all planting material in moss or wet newspaper and store it in a plastic bag until you need it.

If you want to grow blackberries from seeds you must "stratify" them; this means that over the winter you must keep the seed in a box full of sand at a warm room temperature for three months; then store them at 40°F (4°C) for another three months.

Plant cuttings, layers, roots or seedlings in late fall or early spring. Plant seeds in early spring. Allow six feet (1.8 m) between bushes. It is a good idea to plant along a fence, and dig the bed to form a deep bed (see p. 106).

### Care while growing

Blackberries fruit on last year's wood, so prune in winter by cutting out all wood that has just fruited unless you have varieties which fruit for several years on the same wood. If you have these varieties, wood which has fruited should not be cut out so ruthlessly. As a general rule, leave about ten strong newly grown canes to fruit the following year. They are very greedy plants and need rich mulching.

### Pests and diseases

***Orange rust*** This shows up as bright orange spores under the leaves. Look for these if your plants give out spindly shoots with narrow leaves. Root out and burn infested bushes.

### Harvesting and storing

Blackberries are ready for picking when they almost fall off the bush into your hand. Put them in shallow boxes and store in a refrigerator, or freeze (see p. 227) for eating in winter.

## LOGANBERRIES

Grow loganberry bushes in a sheltered place; although they flower later than blackberries, severe spring frosts will damage the canes. Plant the bushes ten feet (3 m) apart. Unlike blackberries, loganberries only fruit in late summer for a two to three week period.

# *Strawberries*

Strawberries are fun to grow, and a good cash crop. Most gardeners would agree with the remark "Doubtless God could have made a better berry but doubtless God didn't".

Strawberries are a "walking" plant, because they are perennials which don't have an elaborate root system. Therefore they exhaust the ground on which they grow within a year or two. To escape from it and find fresh ground they send out runners which meander over the ground until they find somewhere to send down roots.

**STRAWBERRIES IN BARRELS**
*Strawberries grow well in pots and tubs of all kinds. A barrel makes an ideal container. Drill several staggered rows of holes three inches (8 cm) wide and 15 inches (38 cm) apart. Drill the rows at eight inch (20 cm) intervals. Drill several holes in the base and put a layer of gravel in the bottom. Then insert into the center a vertical wire mesh tube four inches (10 cm) in diameter. Fill it with gravel. Then fill the barrel with potting compost up to the first row of holes. Set one plant next to each hole, with the crown emerging. Repeat all the way up the barrel, watering each layer as you go. Finally set four or five plants in a circle at the very top.*

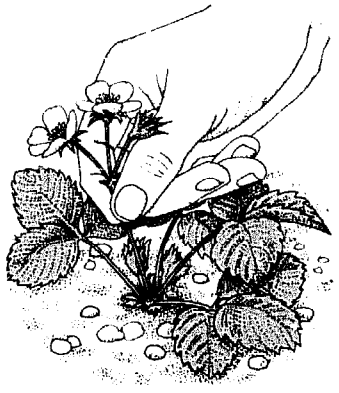
There are several varieties of what are called "everbearing" or "perpetual" strawberries. These fruit later than ordinary strawberries and continue fruiting into late fall. It is a very good idea to plant a few, so as to give yourself a treat in the cold weather. If you force ordinary strawberries in the spring under cloches, plastic tunnels or mini-greenhouses (see p. 111) and have "everbearing" as well, you can have strawberries from early summer to late fall.

### Soil and climate

Strawberries are a woodland plant, and you should bear this in mind when choosing a site for them and looking after them. It means that they tolerate shade, although they fruit far better in sun; they like plenty of humus (they will grow in almost pure leaf-mold as they do in the wild); and they don't object to fairly acid conditions. They do better on light soil than clay, but granted plenty of humus they will thrive in any well-drained place. They are a temperate climate crop and develop a far better flavor in a cold climate than a hot one. It is best to move on to totally fresh ground every three years with new plants.

### Soil treatment

Dig the land one spit deep, incorporating plenty of compost or any well-rotted organic manure. Strawberries do well on the no-digging system (see p. 83) as long as the bed has had enough compost put on it. They are also potash-hungry so, if you have wood ashes to spare, use them on your strawberry patch. Farmyard manure can be rich in potash.



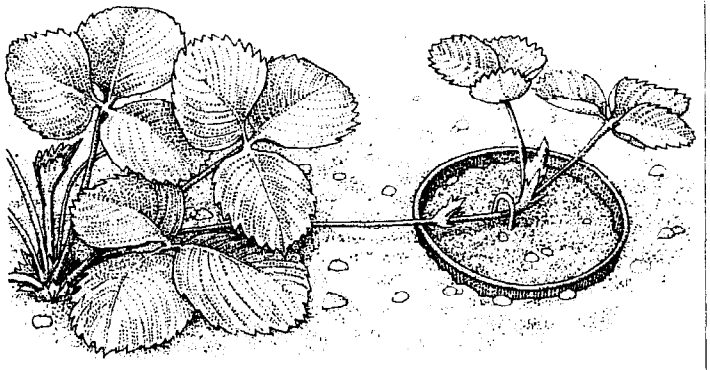
**ENCOURAGING RUNNERS**
*Start with disease-free strawberries from a reputable source. From then on you can propagate from runners. Every year you should remove the blossom from a proportion of your healthy plants, so that they are encouraged to send out plenty of strong runners.*

### Propagation

The first time you plant strawberries, get virus-free stock, from a reputable source, certified healthy. Unless you want to grow new varieties of strawberry, in which case you should grow them from seed, the best thing to do is to multiply them from runners. There are a few varieties that do not make runners, and these are multiplied by dividing up the crowns themselves.

Most varieties of strawberry will make runners that will root themselves whatever you do, but you can encourage them by removing the blossom from a few of your plants. You have merely to sever the runners from the main plant, dig out the little mini-plant on the end of it, and transplant it. But an even surer way of doing it is to bury small pots of soil in the ground near the parent plants and peg the ends of runners down on these pots. When the runners have rooted properly, sever them from the parent, dig up the pots, and transplant to their new positions. In this way you can establish a new strawberry bed every year and scrap one every year, after it has fruited for three seasons. Every fall you will have a newly-planted bed, a year-old bed, a two-year-old bed, and a three-year-old bed, the last of which will be ready for digging up. Always plant your new beds as far from the old ones as you can, to hinder the spread of disease.

You can plant or transplant strawberries at any time of the year (if the winters are mild enough) but it is traditional to plant in spring up to July, as you can then harvest a crop the next year. Plant 15 inches (38 cm) apart with 30 inches (75 cm) between rows. Plant so that the crown is at ground level but the roots are spread out widely and downward. Water the new plants well.



**NEW STRAWBERRY PLANTS FROM OLD**
*Bury pots of soil in the ground near the parent plants, and peg down the ends of runners on top of the pots. Eventually you will be able to sever the old plants from the new, dig up the pots, and transplant them to their permanent positions.*

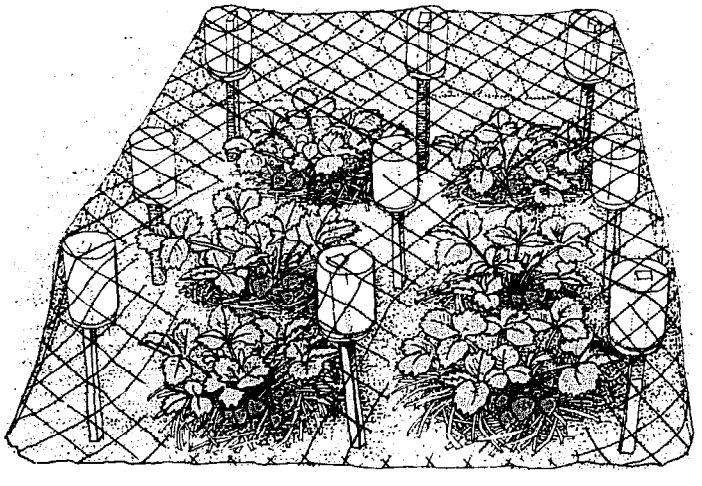
Strawberries do very well on the deep bed (see p. 106). Plant and space them as for a conventional bed.

## Care while growing

It is very easy for a strawberry bed to become infested with weeds. The plants straggle relentlessly and make most methods of weeding very difficult. Hoe for as long as you can hoe and then weed by hand. If you have planted between the end of one summer and the beginning of the next let the crop fruit in the year after that but not before: during the plants' first summer, pick off the flowers.

Prick over the ground with a fork in the spring and, as the crop begins to spread, put plenty of straw under the straggling stems. This suppresses weeds and keeps the fruit clean and healthy. But keep a weather eye out for slugs.

**PROTECTING THE PLANTS**
*When the fruit begins to form put a good mulch of straw under the plants. This keeps weeds down and keeps the fruit clean and disease-free. If birds are a nuisance, make a net. Set up posts and invert a glass jar over each one, before putting the netting over the framework; the jars stop the netting catching.*



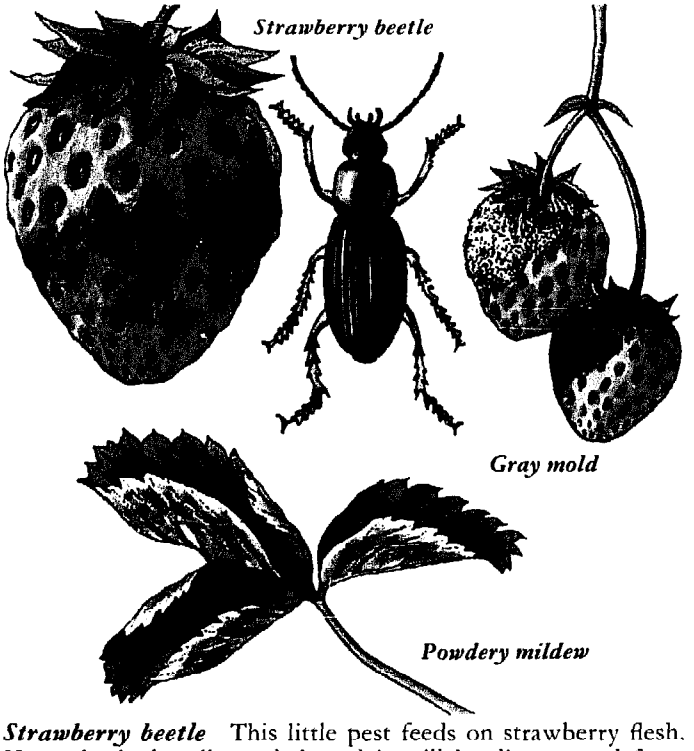
If you suffer much from birds you will *have* to use a net. You can either have a net low over the strawberries, in which case you will have to remove it every time you want to pick a strawberry, or else a fruit cage (see p. 184), which is expensive unless you make it yourself.

## Pests and diseases

Don't try to force your strawberries with nitrogen, because it makes them soft and open to disease.

***Powdery mildew*** This white powder will make strawberries turn a dull brown color. Spray with sulfur at regular intervals.

***Aphids*** These are a menace because they spread virus diseases, principally strawberry crinkle and strawberry yellow edge, both of which show in the leaves and weaken the plant. To prevent it, spray the plant centers hard in April with a nicotine spray or with derris. Don't use the nicotine when the berries are nearly ripe. Remove any stunted or discolored plants and burn them; these diseases are incurable.




***Strawberry beetle*** This little pest feeds on strawberry flesh. Keep the bed well weeded, and it will be discouraged from settling near your strawberries.

***Gray mold*** This is also called botrytis. It appears first as a gray spot on the flowers and then on the strawberries themselves where it grows to form a gray fur which rots the fruit. Dust with flowers of sulfur at the very first sign.

***Rot*** If berries rot after rain, remove them to the compost heap. Pick all ripe berries immediately after rain.

## Harvesting

Pull the fruit off the plant with their stems intact. Leave the stems on until just before eating; when the stems are removed vitamins and other nutrients are lost. Store them in the shade for a few hours, or in a refrigerator for a day or two. Strawberries can be frozen, but go soft when thawed.

After you have harvested your crop remove the straw from under the stems and clear the bed of dead leaves, surplus runners and weeds.

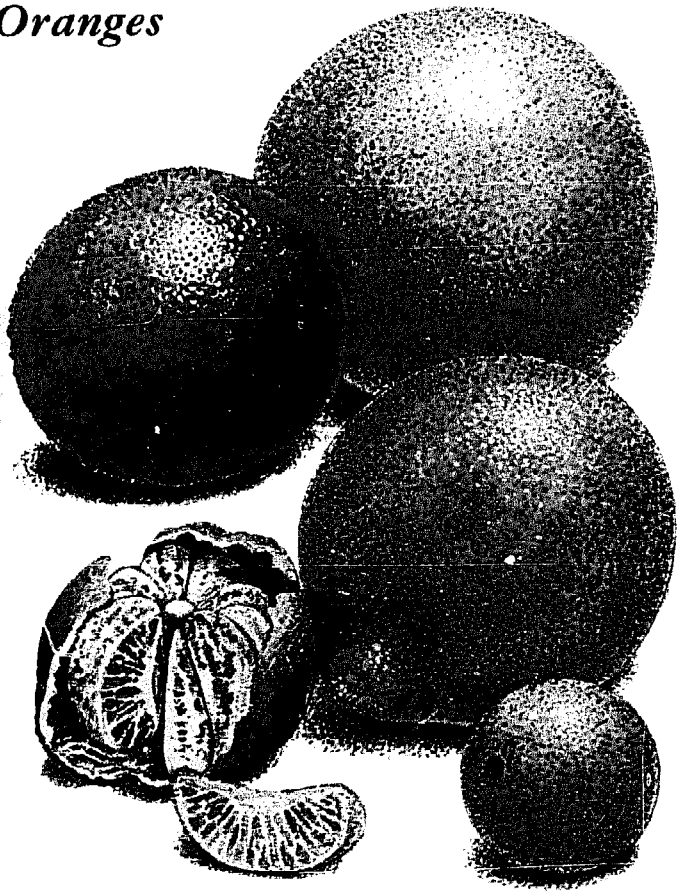
# *Rutaceae*

*Oranges, tangerines, kumquats, lemons, limes and grapefruit* are all members of the *Rutaceae*. Because it includes the genus *Citrus* the *Rutaceae* family is as important to people who live in the sub-tropics as the *Rosaceae* family is to people who live in temperate climates. Citrus plants are very aromatic, broad-leaved evergreens.

Citrus fruits grown in the tropics do not taste as good as those grown in what is known as a Mediterranean climate. At the other extreme they can't stand frost, although oranges can bear marginally lower temperatures than lemons, which are damaged and sometimes killed at temperatures below 26°F (−3°C). This means that citrus fruits growing out of doors tend to be limited to Florida, southern California, Louisiana, Texas and parts of Arizona in North America; and to the Mediterranean seaboard in Europe, South Africa, sub-tropical South America and Australia. But this does not prevent citrus from being a viable greenhouse crop: in the 18th century indoor orangeries were common among the wealthy in England.

My own feeling is that if I only had the space under glass to grow one citrus tree I would grow a lemon. One orange tree provides only a small proportion of the fruit needed by a family through the year, whereas one lemon tree would fill a family's requirements.

## *Oranges*



What the apple is to temperate regions the orange is to the sub-tropics. It is heavy-yielding, delicious, will keep well, and has the enormous advantage that it can just be allowed to hang on the tree, for as long as six months. It is a rich and reliable source of vitamin C. In temperate climates oranges must be grown under glass. This is described on p. 212. They can be grown in tubs, which must be brought indoors in the winter, but the yield from trees grown like this is fairly low.

### Soil and climate

Orange trees can stand winter frosts as low as 20°F (−7°C) but fruit and young growth are injured at temperatures below 25°F (−4°C). Oranges like lightish land: sandy loam is ideal; heavy clay is unsuitable. Deeply drained soil is necessary, for they will not thrive on a high water table. Slightly acid soil is best for them: they will tolerate a pH anywhere between 5 and 7, although they prefer it to be around pH 6.

### Soil treatment

Make sure the site is well drained. Dig deeply, and incorporate phosphatic material and potash into the soil. Rock phosphate, granite dust, wood ashes, compost or farmyard manure, all make a reserve for the roots to draw on in time to come.

### Propagation

Nearly all orange trees are grafted on root stocks, because the best fruiting varieties are not the most hardy and vigorous. It really is best to buy them ready-grafted, because grafting oranges is a delicate process, but if you want to graft your own, the techniques are described on p. 99. When you buy your trees you should take note of the root stocks, as these will affect the type of fruit which your trees produce. The most common root stocks are listed below:

***Trifoliate*** This is best for most gardens. It is disease-resistant, very hardy, can put up with cold better than most other varieties and is a dwarfing stock.

***Cleopatra*** This is the best root stock for tangerines and small oranges.

***Rough lemon*** This root stock thrives on sandy soil. It produces fruit early, but the trees are rather short-lived.

***Sweet orange*** Good on well-drained sand, this root stock is useless on clay, where it gets foot-rot. It produces juicy, smallish fruit.

***Sour orange*** Strange as it may seem, the sour orange root stock is good for sweet orange fruiting stock, because it is hardy and disease-resistant.

There is a huge selection of fruiting stocks available. They are all either sweet for eating, or sour for making marmalade. The most common sweet varieties are "Hamlin", which are small and sweet, "Valencia", which are good to eat and have a long fruiting season, and "Washington Navel", which is the best one for growing in hot dry climates like the desert states of the Southwest.

You can plant orange trees at any time of the year as you would apple trees (see p. 98). All varieties are self-fruitful. Good nurseries send the trees out with their roots balled and burlapped or in large cans. Plant orange trees with extreme care so as not to disturb the earth around the roots.

Place the roots, burlap and all, in the hole; pour some topsoil around the ball, then carefully withdraw the wrapping. A big tree should be 25 feet (7.6 m) from its neighbors: one on a dwarfing stock such as Trifoliate, 20 feet (6 m). Water well after planting and make sure the tree is well watered for two weeks. After that, continue to water regularly – about once a week, depending on the soil.

PLANTING ORANGE TREES
*Your orange tree should arrive from the nursery with its roots already "balled"; that is to say, with a ball of soil wrapped around the roots with burlap. Place the tree in the hole prepared for it with the wrapping still around the roots. Pour some topsoil into the hole before gently removing the sacking.*

A modification of the deep bed method may be used for oranges and all other citrus fruits. Deep dig a circle for each tree. The diameter of the circle should correspond to the drip-line – that is, where the branch extremities of the adult tree are expected to be. Keep the circle of earth raised, heavily mulched, and don't tread on it.

### Care while growing

In regions with high rainfall some watering in dry periods may be necessary for the first three years; after this none is needed except in cases of real drought. In dry areas, where there is little rainfall, trees need a good soaking every two or three weeks; this means 20 to 30 gallons (90-140 l) per tree. More water than this may wash the nutrients down out of reach of the roots. Watering "little and often" encourages foot-rot but watering too sporadically causes fruit-splitting.

You should also feed the soil by mulching heavily with organic material once a year. If low-nitrogen material is used, such as hay or straw, some source of more concentrated nitrogen – bloodmeal or cottonseed meal – should be added to help rot the material down. If rotted compost is used nothing need be added.

Pruning is minimal with orange trees. Trees should come from the nursery already pruned so as to leave a suitable "scaffold" of four or five branches. Small sprouts that come from the trunk under this scaffold should be rubbed out by hand when they are tiny. Old weary trees can be stimulated into new life by pruning some of the old wood away; choose wood in the center of the tree, which does not get much sun. Cut out any frost-damaged branches, but not until the summer after the frost. It is important not to stimulate trees into excessively rank growth by cutting out too much wood. Sometimes upper branches grow so long that the lower growth is shaded. You cannot remedy this by pruning. But in a group of several trees, the solution is to take out one or two, so that more light reaches the rest.

RUBBING OUT SHOOTS
*You will usually receive your tree with a good scaffold of four or five branches already established; it is therefore unlikely to need much pruning. If you notice any new shoots emerging from the trunk, rub them out by hand while they are still very small.*

### Pests and diseases

The many pests that trouble orange trees in inorganic orchards are seldom present in organically managed ones. Eel worm, for example, never becomes a serious problem in an orchard planted on organically rich soil, because predators thrive on unsprayed trees.

***Foot-rot*** In long periods of wet weather orange trees are susceptible to foot-rot, which rots the bark near the soil line and in extreme cases can kill the tree. You can prevent this by observing a few simple rules: keep the mulch at least a foot (30 cm) away from the trunk of the tree; keep that circle free of fallen leaves and debris; don't water right up against the trunk, and don't water too *often*; always keep the junction of trunk and roots clear of soil.

### Harvesting and storing

The delightful thing about oranges is that you can leave them on the tree and just pick them when you want them. Pull tight-skinned oranges off with a twist: loose-skinned ones should be snipped off with a little stalk left on them. They can be stored under refrigeration – at 30°F (−1°C) with a humidity of 80 or 90 per cent – but you are unlikely to need to do this, because oranges have a very long harvesting season. And remember that a green orange is not necessarily unripe. Orange-colored oranges will sometimes turn green again when the weather gets warmer. They still taste the same.

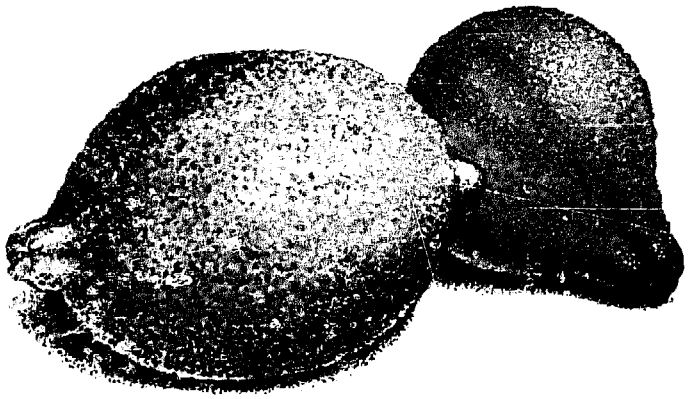
## TANGERINES, MANDARINS AND SATSUMAS

Tangerines, mandarins and satsumas are all classified as *citrus nobilis*. Tangerines have a deeper-colored skin than mandarins and the name satsuma was originally applied to a particular variety of tangerine. The terminology has now become confused and the names mandarin and satsuma are often used to apply to the whole group. The fruits are in general smaller than ordinary oranges, the skins are looser and the sections separate more easily. The advantage is that the trees are smaller and more hardy than orange trees and are therefore suitable for small gardens, roofs, and patios. Cultivate the trees as you would orange trees, bearing in mind that most varieties are not as productive as sweet orange trees.

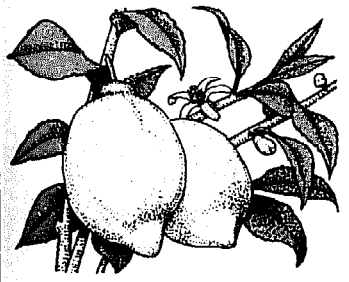
## KUMQUATS

A kumquat tree is an attractive proposition, particularly in a small garden, and they can be grown on roofs and patios in tubs. Kumquats belong to the *Fortunella* genus, but this is so closely related to *Citrus* that crosses between kumquats and oranges can be made. Certainly the orange-colored kumquats look exactly like tiny oranges. The fruits are rarely bigger than one and a half inches (4 cm) in diameter, but are very juicy and good to eat; also the peel is spicy and makes splendid marmalade or candied peel. Kumquat trees are very decorative and rarely grow taller than ten or twelve feet (3 m to 3.5 m), and their other advantage is that they are hardier than virtually any other citrus fruit (especially if grafted on to Trifoliate root stock). You grow them in exactly the same way as oranges.

# *Lemons & Limes*



Apart from ordinary lemons, you can also grow the Meyer lemon, which is a hybrid particularly suitable for small gardens. It is hardy – sufficiently so to survive temperatures of 15°F (−9°C) – and quite small. Out of doors it makes a bush about six feet (1.8 m) tall. It grows well in tubs, on roofs and on patios. Growing lemons in a greenhouse is described on page 212. Limes are used in much the same way as lemons, but contain more acid and more sugar.



MEYER LEMON BUSHES
*This hardy little lemon hybrid will flourish, given a sheltered spot, full sunshine and plenty of compost. Flowers, immature fruit and ripe fruit are all to be found on a thriving bush at one and the same time.*

### Soil and climate

Lemon trees are slightly more tender than orange trees and prefer a heavy soil. As they fruit all year round the crop can be badly damaged by winter frosts. This also applies to limes, which are less hardy still. Lemons and limes are very much a sub-tropical fruit. They will tolerate most soils, provided that the water table is below the depth of their roots which go down no more than four feet (1.2 m). You should incorporate plenty of phosphatic material (see p. 90) into the soil.

### Propagation

Buy lemons and limes already grafted. All are self-fruitful. Plant them as you would any other tree (see p. 98). The most usual root stocks are the same as for oranges. You can plant lemons in a circular deep bed (see p. 110).

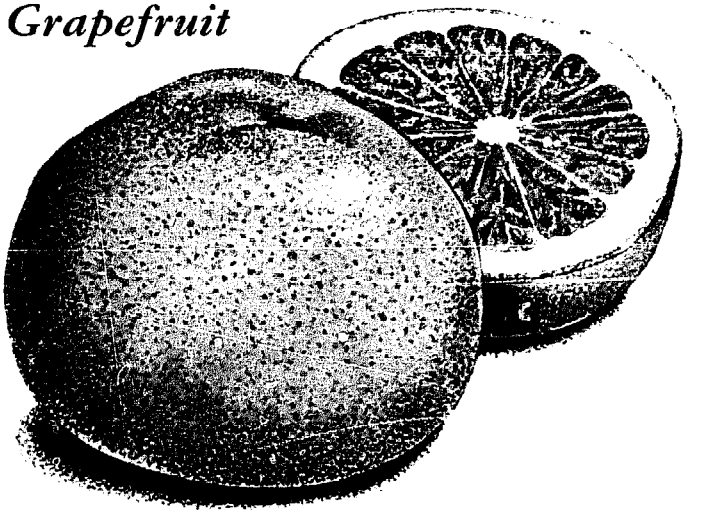
### Care while growing

Lemons need a little more pruning than oranges, enough to stop them from straggling and becoming vulnerable to bad weather. Shorten any outward-straggling branches to inward-pointing buds so as to keep the tree compact. You can do this at any time of the year. Limes do not need any pruning. If your trees are thriving but not bearing, protect them from the wind and feed them a lot of extra compost; this extra attention should make all the difference.

### Harvesting

Both lemons and limes bear all the year round in suitable climates, so just pick them when you want them.

# *Grapefruit*



Grapefruit evolved in the West Indies as a mutation of the shaddock which is a coarse and rather unattractive fruit, but the grapefruit, as we all know, is delicious. It is also a rich source of vitamin C, and is self-fruitful.

### Soil and climate

Grapefruit must have deep, well-drained soil and like it to be slightly acid: a pH of 6 is best. As for climate they can stand as much cold as oranges, 20°F (−7°C), but they need more heat to ripen perfect fruit. In temperate climates grapefruit must be grown under glass.

### Soil treatment

Well-drained soil is most essential. Deep digging – four spade lengths deep if possible – is important, and you should incorporate some phosphate and potash into the soil. Compost or manure buried below the roots can only do good.

### Propagation

Grapefruit are generally grafted on to sour orange root stock, although on poor sandy soil it is better to use lemon. Plant the young trees (see p. 98) at any time of the year; because they are evergreens, one time is as good as another. You must plant them very carefully, as you must other evergreens (see Oranges). Plant trees 25 feet (8 m) from their neighbors. You can plant them in a circular deep bed (see p. 110).

### Care while growing

Grapefruit need plenty of water. In high rainfall areas they need watering for the first three years and then probably not at all. In dry areas they need a good soaking – say 25 gallons (110 l) a tree every three weeks. Don't put water actually on the trunk. Heavy mulching can only do good, provided you keep the mulch two feet (60 cm) away from the tree. Prune them in exactly the same way as oranges; they suffer from the same pests and diseases (see Oranges).

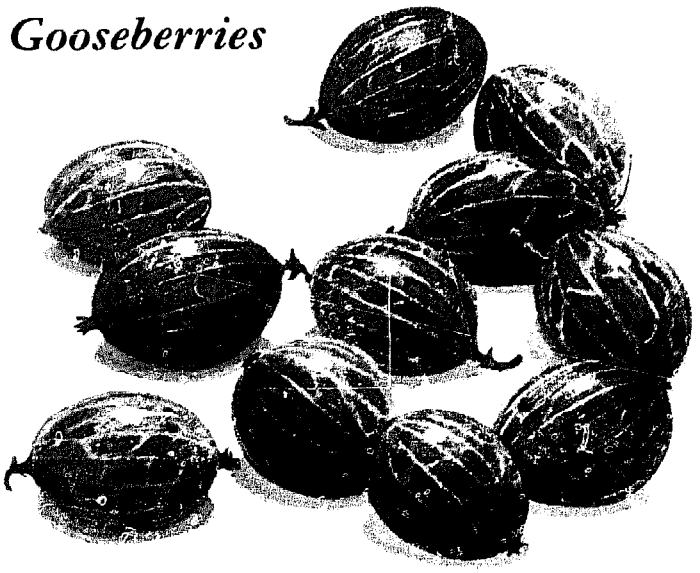
### Harvesting and storing

They will stay happily on the tree for months, but when the fruit begin to turn yellow test an occasional one so that you know when to pick them. When they are just right pick them, wipe them with a clean damp rag, let them sit in a cool place in a breeze for a few days, then put them in the refrigerator. If you haven't got a refrigerator put them in a water-cooled safe.

# *Grossulariaceae*

*Blackcurrants, red currants, white currants and gooseberries* are members of the family *Grossulariaceae*. They belong to the important genus, *Ribes*, all of whose members are shrubs which display familiar small round berries. Currants and gooseberries are exceptionally hardy and are cultivated almost as far north as the Arctic circle. They are less popular in north America than in Europe, because they can be alternative hosts to white pine blister rust and are for this reason prohibited in some areas. Personally I would rather have blackcurrants and gooseberries and prohibit white pines, because I think they are both magnificent fruits, and blackcurrants are probably the best source of winter vitamin C available to mankind. White currants, which are actually nearer yellow than white, have a fine, distinctive flavor when eaten raw. Red currants are grown primarily for making into red currant jelly, though they are good eaten raw or cooked.

## *Gooseberries*



Gooseberry bushes are good plants to grow in smallish gardens because they yield a lot of fruit from a small area. They can be trained as cordons (see p. 101), in which case they take up hardly any space at all. They are self-fruitful.

### Soil and climate

Gooseberries will thrive in almost any soil but have a slight preference for heavy soils. They like a cool climate, and are very tolerant of shade. They can therefore be planted in places where there is too much shade for most plants.

### Soil treatment

Dig deeply and incorporate manure or compost in the top spit, over quite a wide area, because the roots are shallow but spread a long way laterally. A pH of 6 to 8 is suitable for them. Incorporate some lime if the pH is less than 6.

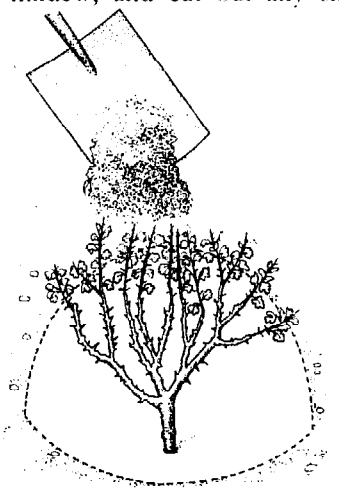
### Propagation

Plant new bushes in early spring. Bush plants should be five feet (1.5 m) apart and cordons a foot (30 cm) apart in the row. In a deep bed (see p.106) gooseberries should be planted four feet (1.2 m) apart in a line down the middle of the bed.

### Care while growing

When the bushes are two or three years old cut half the length off each leader to a suitable bud. If the plant is droopy cut to an upward-pointing bud: if it is upright cut to an outward-pointing bud. Cut all lateral growths back to within three inches (8 cm) of the stem. In each subsequent year cut out a good proportion of the old wood.

Every summer shorten all laterals, keeping about five leaves on each. At that time you can examine the bushes for mildew, and cut out any shoots that are infected. Gooseberry bushes should be grown on a "leg", a short main stem. You must keep the ground under and between the bushes clear of weeds. Don't dig, for fear of injuring the shallow roots, but hoe, scuffle or till very shallowly.



**"MOUNDING" GOOSEBERRIES**
*Cut an old bush back in early spring to within twelve inches (30 cm) of the soil. This encourages new shoots to grow. Then in midsummer build up a mound of earth and compost around the bush, so that only the tips of the canes are visible By fall the canes will have put out roots. You then gently remove the earth, cut out the canes with the strongest roots and transplant them.*

### Pests and diseases

***Powdery mildew*** The first symptoms of this is a white felt which covers the young leaves and shoots. The berries themselves acquire a brownish covering. The best prevention is not to give the bushes too much nitrogen. If you do get it pick off and burn all affected shoots, and spray, in midsummer, with a mixture of half a pound (225 g) of soft soap, one pound (450 g) of washing soda, and six gallons (23 l) of water. You can spray with this again in the spring when the bushes flower and once again when the fruit is set.

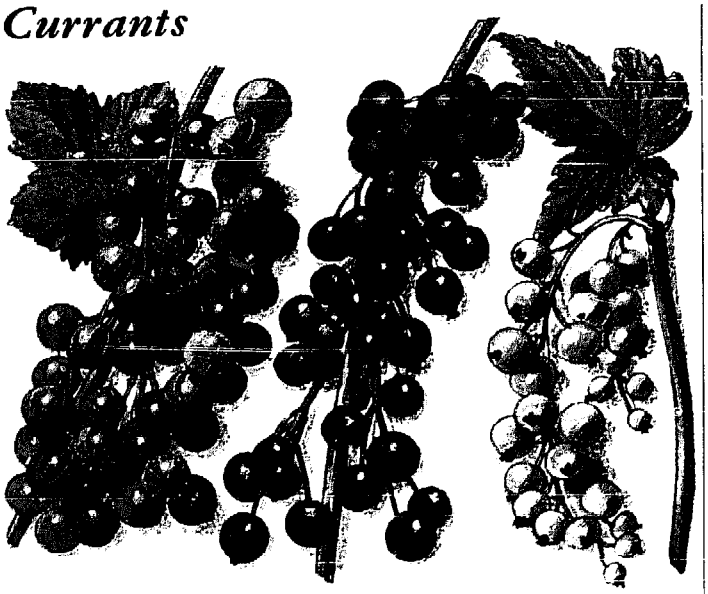
***Gooseberry sawfly*** These are small caterpillars with green and black spotted bodies and a yellow tail. They produce three generations in a season and can strip your bushes of leaves. Spray hard with derris or pyrethrum.

***Red spider mite*** The tiny red mites cluster on gooseberry leaves causing them to turn bronze with a white area underneath. Ultimately the leaves will dry up and die. The answer is to knock them off the bush with a jet of water.

### Harvesting

Strip the fruit off by pulling the branches through a hand protected by a thick leather glove. The fruit falls off and can be caught in a sheet. It can then be separated from the leaves and other flotsam that get stripped off by rolling the whole lot down a board. The fruit rolls, the rest does not. If you don't eat them fresh, can them or make jam.

# *Currants*



## BLACKCURRANTS

Blackcurrants are one of the best and most reliable sources of vitamin C in cold, moist climates. Alaska is not too far north to find them growing and they thrive on a cool north slope. They are hardy and easy to grow, store well and make all sorts of delicious preserves and wines. They are heavy yielding, self-fruitful and take up little room. You do not have to wait too long to start picking either. In my view, of all fruits either "hard" or "soft", blackcurrants are the most rewarding to grow.

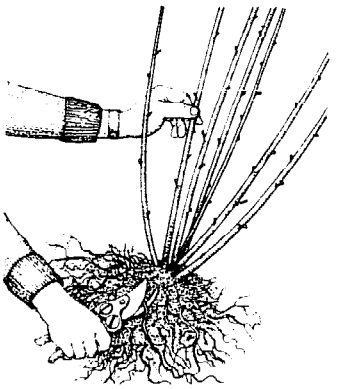
### Soil and climate

A fertile heavy clay-loam with plenty of organic matter in it is perfect for blackcurrants, but you can grow them on practically any soil if you add enough compost or farmyard manure. I have grown them with great success on heavy boulder clay and on sand, but with both I had to mulch heavily every year with organic material. A great advantage of blackcurrants is that they are hardy enough to be planted in frost pockets. They like a cool and moist climate, because hot winds dry up their leaves. But they can be grown in hot dry states as long as they have some shade, such as the north-facing wall of a house. You can also intercrop with apple trees in an orchard, although in this case make sure that the bushes are not starved of moisture as well as being protected from heat.

### Soil treatment

Blackcurrants are shallow-rooted. Nevertheless prepare the ground by digging deeply, because they benefit from soil that is well drained and aerated. Also incorporate plenty of organic material before planting. Dig in ground rock phosphate if you can get some cheaply, bone meal or anything else that is going to last a long time and release nutrients slowly. I always give blackcurrants plenty of manure, but I don't use well-rotted compost, because I reserve this for the things that really cannot do without it. For all my soft fruit, including blackcurrants, I use long-strawed stable or cow-shed manure.

Make sure the ground is free of perennial weeds: once the bushes are in the soil it will be hard to destroy any weeds that are left.



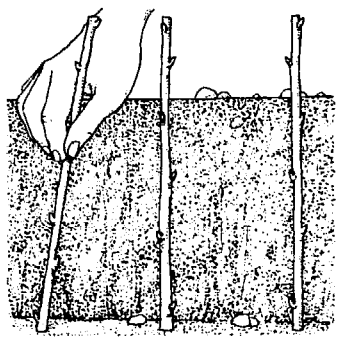
**TRIMMING BACK ROOTS**
*When you are planting your blackcurrant bushes, the roots should be wet. Spread them out well over the shallow holes you have dug in readiness, and cut back first any roots which are broken or torn. Then trim back any very thick roots, but leave all the fine, fibrous ones intact.*

### Propagation

To start off it is best to buy bushes from a reliable nursery so that you are sure they are healthy. After that you can multiply your own stock for the rest of your life, because blackcurrants grow very easily from cuttings. Because currant buds start growing very early in spring, plant the bushes in late winter; if your winters are not harsh, plant in the fall, so the roots can get established before the ground freezes.

When you plant your new bushes dig wide shallow holes four feet (1.2 m) apart. If the roots of the bushes are dry when you get them, soak them in water for several hours before planting. Spread the roots carefully, first snipping off any very long or broken ones. If you use the deep bed method (see p. 106) plant a row of bushes along the middle of the deep bed at intervals of four feet (1.2 m), preferably alternating currants with gooseberries. Use the space at the edges of the bed to grow annual vegetables. As soon as you have planted the bushes snip off all the branches to outward-pointing buds, leaving at least three or four buds on every shoot.

When you come to propagate from cuttings you must use the current year's wood. Blackcurrants fruit on the previous year's wood, so it is not expedient to cut too much new wood off the bushes. But when you are pruning older bushes you will inevitably cut out a certain amount of old wood on which some new wood has sprouted.

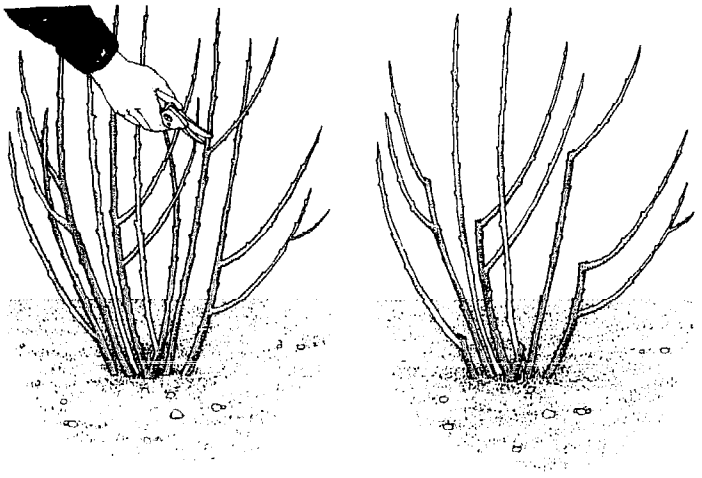


**PROPAGATING FROM CUTTINGS**
*Prune off cuttings of new wood from eight to twelve inches (20-30 cm) long, and in the fall plant them deeply in good light soil with two buds above ground. Keep them from drying out, and protect them with a straw mulch; plant out the following spring.*

### Care while growing

Prune the bushes annually in early winter. The thing to remember is that they fruit only on the previous year's wood, so you cannot expect any fruit the first year. Therefore, preserve all new wood (which is yellow or light brown) every year, if you possibly can, so that it can fruit the following year, but cut out all the wood that has already fruited. You can tell which is the older wood because it will still have the little stalks of the berries on it.

Mulch with plenty of manure, and wood ash when you have it, and keep the ground clear of weeds.



PRUNING BLACKCURRANTS
*Every year in early winter cut out as much old wood that has already fruited as possible, while preserving the new wood. Cut off the old wood just above a good new low-growing shoot.*

### Pests and diseases

***Leaf spot fungus*** This distressing disease can cause all the leaves to turn brown and drop off in midsummer. Rake up all the affected leaves and burn them or put them in a hot compost heap.

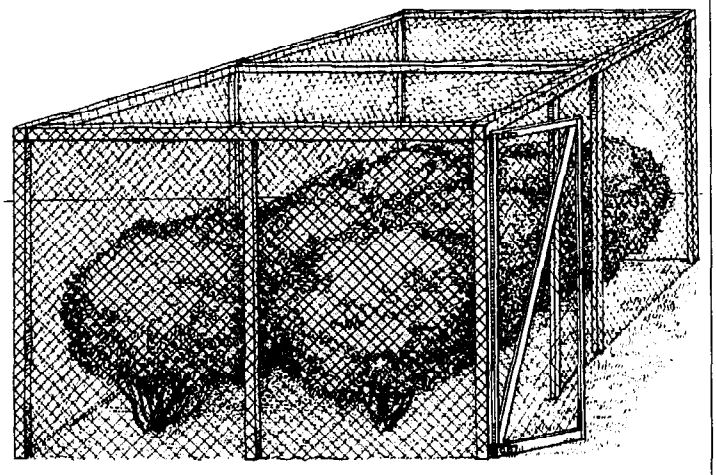
***Currant maggot*** The blackcurrants themselves are sometimes attacked by maggots. This can ruin your crop, so keep an eye out for it. Currants that ripen before their time should be examined and any with maggots destroyed.

***Big bud*** This very common disease causes the new buds of the plants to swell unduly in midsummer. Simply pick off all such swollen buds and burn them.

***Reversion*** The big bud mite carries the reversion virus. The leaves of the bushes change shape and look rather like nettle leaves. The bushes flower earlier and the flowers are brighter than usual, but the crop is poor and dies fast. There is no cure for reversion, so the moment you notice it you should root up the bush and burn it.

***Currant shoot borer/Currant core borer*** Apply a winter wash in January with a tar-oil spray to prevent these pests; the spray will also keep off aphids. If you do see a cane's leaves wilting at the tip, cut the branch back until you find the tunnel, and kill the borer.

***Coral spot/Dieback*** These two fungus diseases are caused by too much nitrogen. Cut back any wood that seems to be dying, or which shows the distinctive red spots of coral spot on the branches. Cut right back to sound white wood, and burn the affected branches. Then stop feeding the bushes with high nitrogen manure such as stable manure; mulch instead with waste vegetable matter, spoiled hay or straw, and a little well-rotted compost.



PROTECTING BLACKCURRANTS
*If birds are likely to strip you of your entire blackcurrant crop, you must protect the bushes. An excellent way of doing this is with a fruit cage of wire mesh supported on a frame.*

### Harvesting and storing

You can just leave currants on the bushes if there are no birds; likewise if you grow them in a fruit cage there is no hurry to pick. But don't leave them too long, or they will fall off the bush. Currants freeze well, can well, and make fine wine, jelly or jam. They are one of gardening's greatest rewards eaten raw with cream.

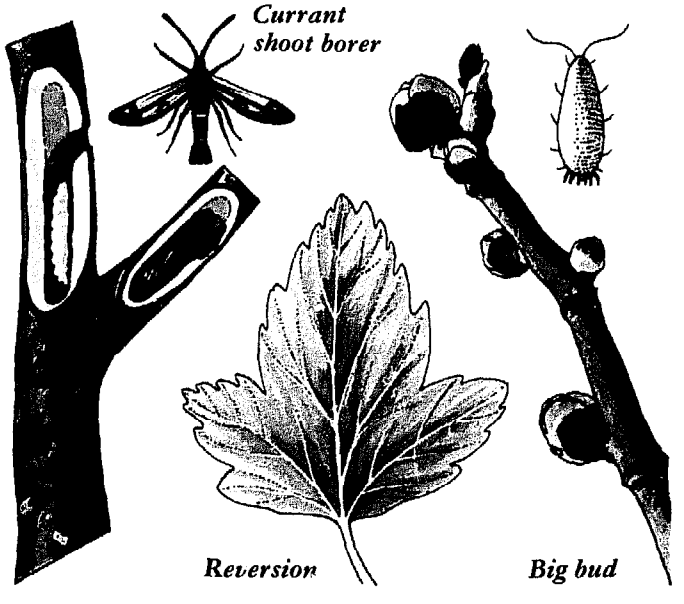
## RED AND WHITE CURRANTS

You should treat red and white currants in exactly the same way as blackcurrants, but there is one important difference. The fruit on red and white currant bushes is borne on two or three-year-old wood. This means that you prune for the first time when the bush is two years old, by cutting out all the wood except seven or eight good shoots. Each year after that cut out all new shoots, except for three or four which suit your plan for the shape of the bush. In the third year and every year after that cut the oldest shoots right back to the ground.

The aim is to have a few one-year-old, a few two-year-old and a few three-year-old branches on every bush, with plenty of short fruiting spurs on each branch. The other important thing is a good shape – open in the middle, not too spread-eagled and yet not too bunched up.

Prune the fruiting spurs as you would on an apple tree (see p. 170), because the fruit is borne on spurs like apple spurs. The principle is to snip back side-shoots to one or two buds to encourage spur-making.

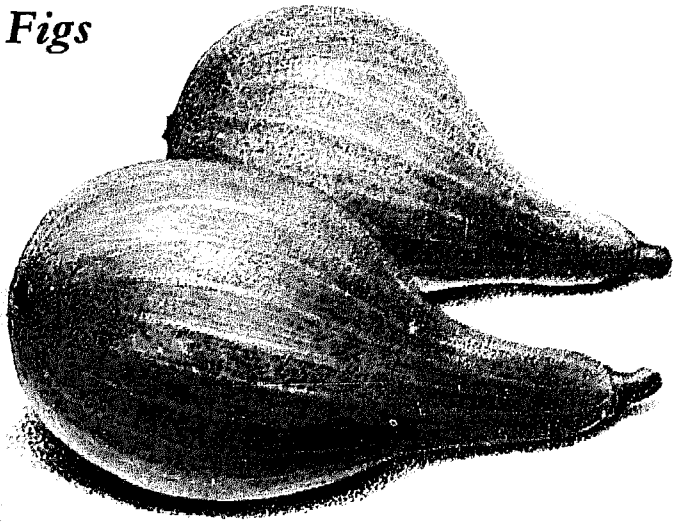
Bush trees should be trained on "short legs" (main stems a few inches high), but red and white currants are also excellent for cordon training or espaliers (see p. 101).



# *Moraceae*

*Figs and mulberries* belong to the family *Moraceae*, whose other members include: hemp; hops; the rubber trees of south-east Asia and their diminutive, the popular household rubber plant; and a number of tropical and semi-tropical trees with exotic-sounding names like the breadfruit tree, the snakewood tree and the trumpet tree. Figs and mulberries are unusual members of the family in that they thrive in temperate climates. All they ask is plenty of sun. And figs do better on poor soil than on rich soil, where in order to make them fruit their roots must be confined artificially. Figs and mulberries are both delicate fruits which do not travel or store well. They should therefore be eaten fresh from the trees; otherwise figs must be dried or canned, and mulberries must be made into jam or wine. Both trees are attractive and long-lived and grow to about 30ft (9 m) high.

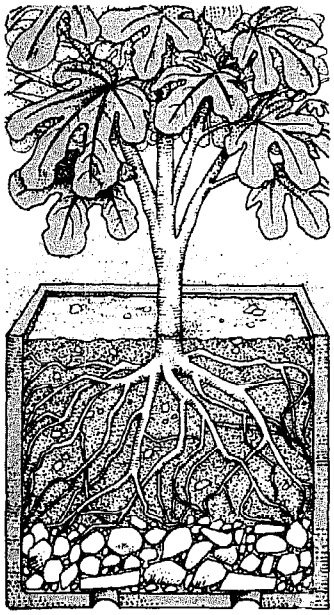
## *Figs*



In ancient Greece figs were said to be the food of the philosophers. Whether this is so or not they are quite an experience to eat. They will also grow in much colder climates than is generally thought, as long as they get all the sun going and plenty of water. The common types are self-fruitful.

### Soil and climate

In temperate climates, figs will flourish on the worst soil you have, provided that it is well drained and in full sun. They grow very well against a south-facing wall and will tolerate clay, lime-rich soil, sandy soil or rubble.



**CONFINING FIG TREE ROOTS**
*If you plant a fig tree in good soil, it will grow well and get very large, but it may not set any fruit for as much half a century. This is because the roots spread so much further than the top of the tree that a severe imbalance is caused: nourishment at the root tips never reaches the leaves, so branches straggle and growth is weak. The solution is to confine the roots. Grow the tree in a concrete box buried in the ground. Allow for drainage from the box by making one or more drainage holes in the bottom. Shield the holes well with tiles or broken crockery, so that water can get out but the roots stay in.*

### Soil treatment

Figs like plenty of humus so you can mix compost with their earth. Give them a little lime as well. In heavy clay, poor gravel or sandy soil you will have no problems; this is the sort of soil found in the warm countries where the fig is native. But in all other soils it is best to confine the roots. This can be done by growing the trees in a concrete box, or in any other sturdy receptacle, buried in the ground. They will also grow in barrels or huge pots, indoors or on a patio. Allow for drainage from the box or container.

### Propagation

Figs will grow from suckers, cuttings or layers (see p. 95). To grow them from cuttings, cut lengths of ripe wood about a foot (30cm) long from an existing tree in late fall. Plant these cuttings in a shallow trench of good light loam, so that they come out of the earth at an angle of 45 degrees. Leave one growing point only above the surface. Plant the cuttings at nine inch (22 cm) intervals. Cover them with loose earth during the winter, so that they are completely buried. In spring scrape away the surface soil and expose the cuttings, cover them with cloches, and water them whenever the soil is dry. They must not dry out. When the weather has really warmed up, remove the cloches, mulch well, and keep them well watered until the fall. Then plant out the cuttings in their final position, taking great care not to damage the roots.

If an old tree throws up suckers from its roots you can dig these out in late autumn, keeping the roots intact, and plant them in their permanent position. You can also layer a low branch by pegging it down to the soil. Once it has rooted, transplant it.

### Care while growing

Cut out a branch from time to time to keep the tree open, if it seems to be overcrowded. And in early summer each year nip off the first half inch (1 cm) of all the leading branches to make them bush out instead of allowing them to grow long and straggly.

When the fruit begins to swell, water copiously. Two and a half to three and a half gallons (9-14 l) a day in dry weather.

### Pests and diseases

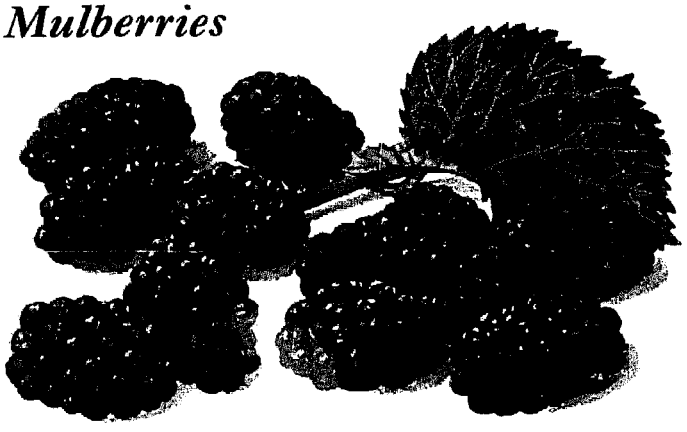
***Cotton root rot*** Figs get this disease if they are planted after cotton. It is incurable; trees wilt and die.

***Souring*** If disease-carrying insects get into the open end of the fruit, the fruit will shrivel and taste sour. Pull off any diseased or shriveled fruit and put on the compost heap.

### Harvesting and storing

Eat your figs straight from the tree when they are ripe. Any that you can't manage to eat should be dried. This can be done in hot sun, on racks, or in a drying box (see p. 216)

# *Mulberries*



The name mulberry in fact refers to a multitude of fruits, from a white or red mulberry tree 50 or 60 feet (15-18m) tall, right through to a white mulberry shrub grown to feed silk-worms. The white mulberry grown so freely in the mountains of Persia is an insipid fruit, but the wine-red mulberry grown in America and Europe is a splendid fruit and deserves to be cultivated a lot more. It is self-fruitful.

### Soil and climate

Mulberries will grow in any garden soil with a neutral pH. Most varieties are very hardy in temperate climates, apart from the black mulberry which grows only in hot regions.

### Soil treatment

Dig deeply and incorporate compost or manure.

### Propagation

If you can get a tree from a nursery, just plant it as you would an apple tree (see p. 98). Allow it plenty of room to grow; trees should be about 30 feet (9 m) apart. They can be planted in circular deep beds (see p. 110). After you have planted one or two, the trees will proliferate, because birds drop seeds far and wide; otherwise you can propagate from cuttings (see p. 95).

### Care while growing

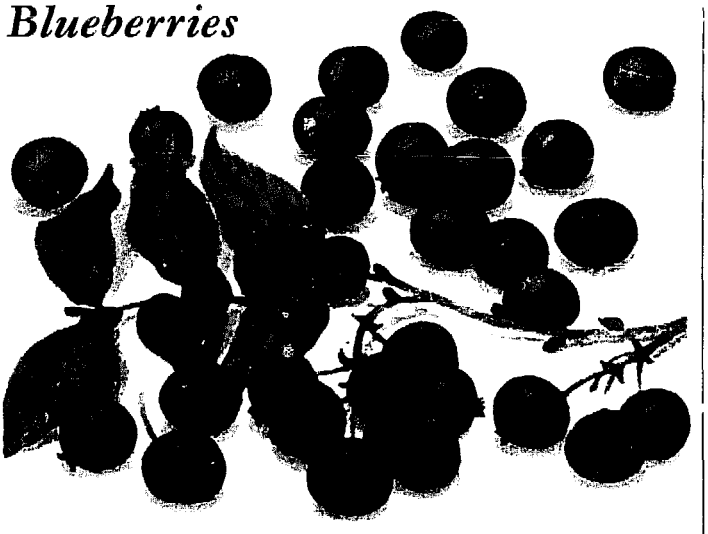
There is nothing difficult about growing mulberries. Just give the trees a good mulching now and again. They are rarely attacked by pests or diseases. When the trees are established, sow grass around them, because this will facilitate harvesting.

### Harvesting and storing

Mulberries are highly perishable, so eat them when they are ripe. From a commercial point of view this is a disadvantage; the fruit does not keep for any time at all and must be eaten very quickly. Wait for the fruit to fall to the grass below the tree and gather it immediately. If the tree is situated so grass cannot be grown beneath it, spread hay or straw on the ground during the fruiting season. A word of warning: mulberry juice stains very badly, so wear old clothes when harvesting.

Mulberries and cream are delicious; mulberry wine (see p. 224) can be superb. Birds adore mulberries; if you grow them near cherries they will eat the mulberries and leave the cherries; if you grow them in or near a chicken run, the great weight of fruit that a mature tree produces every summer will fall to the ground and feed the hens, and you will get all you want too.

# *Blueberries*



Blueberries are the fruit for those who have sandy, acid, waterlogged soils in cold climates. Blueberry is often misused as a collective name for several species of the *Ericaceae* or heath family, which includes such fruits as bilberries and cranberries. All these edible fruits grow wild, in cold mountain climates where no other fruit will grow. Only the blueberry proper can be cultivated with success, however, and there are several improved cultivars. It can grow as high as 15 feet (4.5 m). The bushes are slow to mature; after three years they will probably provide you with at least some fruit, but it may take as long as eight years before they bear a full crop. Mature bushes bear very heavily, especially if you plant two or more varieties together.

### Soil and climate

Wild blueberries grow on very acid soils with a high water-table. They do not possess root hairs, so they cannot suck moisture from damp soil particles as other plants can. They therefore need water within reach of their roots. Also they cannot absorb nitrates and must therefore have their nitrogen in the form of ammonia. This means they must have an acid soil because ammonia-forming bacteria cannot live in anything else.

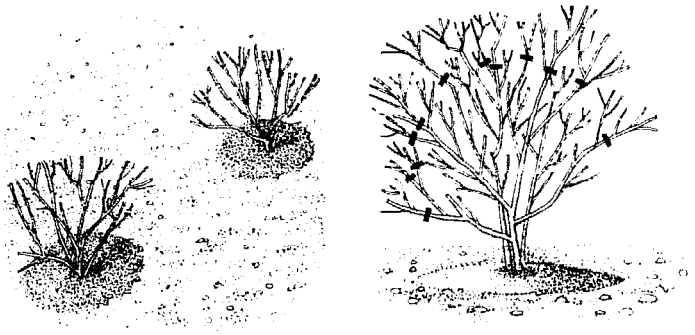
Ideally they should be planted in light loamy soil with plenty of humus and some sand, and the pH should not be above 5; 4.5 is ideal. They must have a cold climate with at least 100 nights at a temperature as low as 40°F (4°C), but they should be planted in full sunlight.

### Soil treatment

Blueberries must have plenty of organic material. They will not grow in purely mineral soils, no matter how much artificial fertilizer is put into it. If the pH is above 5 you should lower it by digging in plenty of leaf-mold, sawdust, or peat some months before you intend to plant.

### Propagation

Blueberries do not root easily and it is better to buy plants from a nursery. Plant them in spring six feet (1.8 m) apart in rows eight feet (2.5 m) apart, in shallow holes which have been filled with an equal mixture of topsoil and organic matter. After planting, mulch heavily with sawdust, and cut half the length off each branch. Blueberries will grow from layers (see p. 95) as well. Nick the underside of each branch before pegging it down for layering.



PLANTING BLUEBERRY BUSHES
*Immediately the bushes are planted, give a four to six inch (10-15 cm) mulch of sawdust (above left). At the same time, cut all the branches back by half (above right); this gives the roots a chance to catch up with the top growth.*

### Care while growing

Keep the soil constantly moist under the mulch during the first year. For the first four years don't allow the bushes to fruit at all. Strip off all flower-clusters. From the fifth year on remove all fruiting buds except one for every three inches (7 cm) of branch. Cut out some of the main branches, aiming to leave one for every year of the tree's age. Cut out all small weak laterals every summer. The bushes do not reach full maturity until they are ten to fifteen years old. From then on they will yield as much as 30 pints (17l) per year. When strong new shoots grow up above the top of the bush cut them down to the level of the bush to encourage the growth of laterals. Every year the trees must be heavily mulched with organic material. Don't let any lime or sea-sand come near them.

### Pests and diseases

***Tent caterpillars*** These pests are the most harmful insects to attack blueberries. They spin tents of silk over the leaves; either pick off the eggs during the winter or remove caterpillars and eggs in the spring.

***Canker*** This causes reddish-brown wounds on the stem which kill the buds nearby, and in severe cases can girdle the trunk and kill the whole cane. Canker can be prevented by growing the blueberries in an airy place, by keeping the bush open by pruning, and by immediately removing any cankered material.

HARVESTING BLUEBERRIES
*Leave the fruit on the bushes until it has become really soft. Then test each one by rolling it gently between thumb and finger: the ripe berries will come off easily and the unripe ones will stay on.*

### Harvesting and storing

Let the fruit stay on the bushes until it really begins to soften, which will be about ten days after it turns blue. This is when the sugar content is at its highest, and consequently when the flavor is strongest and sweetest. If you pick the fruit any earlier, they will be rather tasteless. Then roll the berries gently so that the ripe berries come off and the unripe ones stay on. Store in a refrigerator, or freeze (see p. 227).

## *Olives*

Not only can a man live on olives, bread and wine alone (and many a man has), but from this fruit is expressed the best edible oil in the world. Olive trees are not reliably self-fruitful. It is best to plant two or more varieties.

### Soil and climate

The olive will thrive in practically any soil; it grows in Mediterranean countries where there is no true topsoil at all. But as to climate it is very specific. It needs a cold winter – around 45 to 50°F (7-10°C) – but never below 10°F (−12°C), because this will kill it; even 18°C (−8°C) will do it some damage. Although they don't suffer from late frost, they need a hot summer; it can scarcely be too hot. If you are not between latitudes 30° and 45°, either north or south of the equator, it is not much good trying to grow olives; nor can they grow above 2500 feet (800 m).

### Propagation

The easiest thing to do is to buy a sapling, and plant it like any other tree (see p. 98). Otherwise olives are best propagated from cuttings in a mist propagator (see p. 97). It is best to use softwood cuttings of the current season's growth. Take the cuttings in early autumn. Small cuttings should be planted vertically, larger ones horizontally below the soil.

### Care while growing

In the first three years after planting the tree should be shaped to make four or five good strong branches for the scaffold. Cut out all other branches, crossing branches, and branches which grow inward. Let the new laterals on the main scaffold branches grow. By the fifth or sixth year the tree should begin to fruit. If in any one year the tree bears a huge amount of fruit, thin it; otherwise it will strain itself and not give any fruit next year. In countries with very dry summers irrigate plentifully during fruiting.

### Pests and diseases

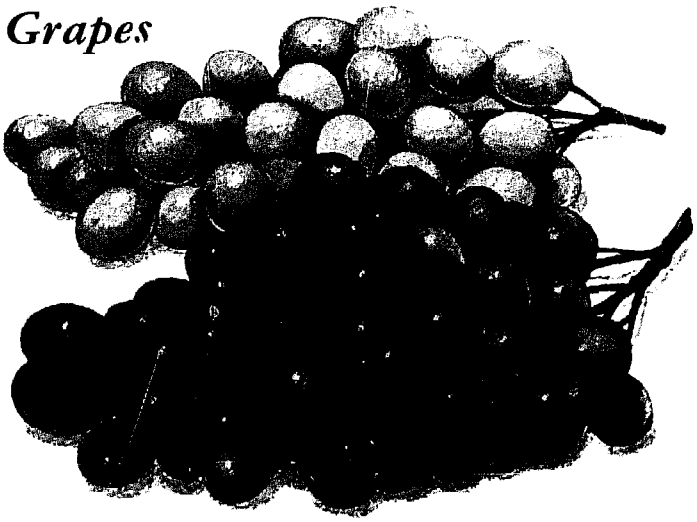
***Olive knot*** This causes swellings on any part of the tree. Cut out such swellings and paint the wounds with tree paint.

***Split pit*** Heavy watering after a drought when the fruit is swelling causes the stones inside the fruit to crack, ruining the fruit. Keep watering regularly while the tree is fruiting and you won't get it.

### Harvesting and storing

Pick the biggest olives by hand from the tree in the fall and use them for pickling (see p. 218). Fruit from which you wish to press oil should be left on the tree until late in the winter, when it will be quite shriveled. You then beat the branches with poles and catch the olives on tarpaulins spread on the ground.

# Grapes



"Without wine all joyless goes the feast" sang the poet and certainly since ancient times the vine has had a notable effect on the development of civilization and culture.

Like the olive, the vine, which belongs to the family, *Vitaceae*, grows out of the subsoil. There is a theory that the early Mediterranean mercantile civilizations came about because the overcropping of wheat, and the grazing of goats, caused the topsoil to waste away in those countries. The inhabitants were forced to farm their subsoil, which they did with such crops as vines and olives. They were then forced to trade wine and oil for wheat. This meant they had to become potters (because they had to make *amphorae* to carry wine and oil), shipbuilders, sailors and merchants. This in turn sped up their industrial and mercantile development.

Some variety of grape is native to nearly every temperate region of the world, and to several subtropical ones as well. Grapes of the Mediterranean species, *Vitis vinifera*, and their hybrids will grow and ripen to wine status in virtually all mild parts of the U.S. Americans are also lucky in having two native species: *V. labrusca*, also known as the fox grape or Concord, and *V. rotundifolia*, the Muscadine or southern fox grape.

### Soil and climate

Vines grow well on poor, dry, stony soil. They will grow on limestone soil, and certain varieties will even flourish on chalk, although this is not ideal.

Stony soils on slopes make good vineyards. Many of the best French vintages come from alluvial gravel terraces. I have grown grapes successfully on soil composed largely of decayed fossil seashells. Rich clay soil is bad for grapes, causing them to lose their fruit or ripen it too late. It is fortunate for mankind that the vine thrives on soil that is little good for anything else.

The climate most suitable for grapes is the Mediterranean type. The winter must be cold enough to give them a dormant period, but not so far below freezing as to harm their dormant vines. Most varieties can take temperatures as low as 27°F (−3°C) or even 17°F (−8°C). In cases where the temperatures are lower than this the plant vines can be bent down and covered with earth to protect them from the elements. Alternatively you should plant exceptionally hardy varieties. Most varieties are self-fruitful.

But more important than winter temperatures are the warmth and sunshine which grape vines must have in the summer, both for the fertilization of the flowers in late spring, and for the ripening of the fruit in late summer. Dessert grapes do not need as long a ripening period as wine varieties; grapes that are pleasant to eat may still not contain enough sugar to make good wine. Late spring frosts are not a problem, because the vines start growing late enough to miss them.

### Soil treatment

Clear the soil completely of perennial weeds; incorporate rock phosphate and potash, and dig deeply. If the pH is much below 6, lime to bring it to about 7. Good drainage is absolutely essential.

### Propagation

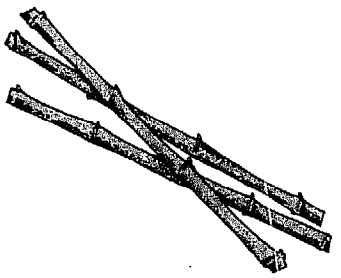
You can, of course, buy year old plants from a nursery. But most vines are grown from cuttings, although it's often hard to stop them growing from pips, which rarely produce strong heavy-yielding vines. If you have existing vines, make cuttings by separating your winter prunings into two bundles: the ripe, reddish-brown wood and the tender new wood. Tie the ripe wood in bundles, marking the top end with a tiny scratch, label the bundles with the variety, and bury them in moist sand. Feed the new wood to rabbits or goats, or put it on the compost heap. Take the bundles out in March and select the pieces which are about as thick as pencils; make cuttings by chopping them into foot-long (30 cm) lengths, with a bud near the bottom of each. The best cuttings are made from canes with about three or four buds to the foot. Make a long deep nick with a spade in the sandiest soil you have and plant the cuttings the right way up. The top bud should be just above soil level. Stamp the cuttings in hard.

During the summer most of these cuttings will root, and by the following spring, they will be ready to re-plant. Now, most experts tell you to dig a wide hole for each cutting and spread the roots carefully over a mound of earth. I suggest that you simply snip off all the roots of each new plant to about two inches (5 cm) so that it looks like a shaving brush, then make a hole with a crowbar, about six inches (15 cm) deep, drop the plant in, and stamp the soil down firmly. I know this works because I have done it successfully and seen it done in Italy. You will get excellent results this way because the new vine is forced to put out plenty of new fine roots.

***Grafting*** Grafting grapes is quite simple and should be done in winter. Wood of the root stock should be cut to one foot (30 cm) lengths with three or four buds on each. The scions should be cut to two or three inch (5-8 cm) lengths with one bud. Cut the scion and the stock as you would for any other grafting (see p.99), and tie them together with raffia or sticky tape. Cover the joint with wax.

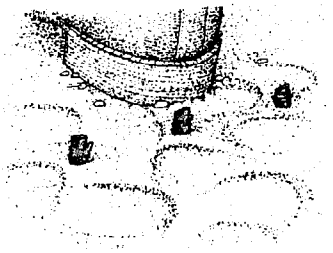
When this process is complete bury them shallowly in layers in moist clean sand. Put the box containing them in some place where the temperature does not fall much below 70°F (21°C): a heated greenhouse is ideal. As soon as warm weather comes, plant them out at a slant in a holding-bed, with one bud of the scion just above the soil. Soon after midsummer scrape the soil away and cut off any roots that have grown from the scion with a sharp knife. Do this again at the same time the next year. Do not allow the scion to put down roots.

Plant out stocks and scions in the vineyard in the second or third year. Plant them with the joint just above the ground, but then heap some soil over the joint to cover it. After a year hoe the soil away, since the joint will now be



**TAKING GRAPE CUTTINGS**
*In winter, tie ripe prunings in bundles and bury them in damp sand. Take them out in the spring and chop the best into sections a foot (30 cm) long, leaving a bud on each. The best cuttings have about three or four per foot.*

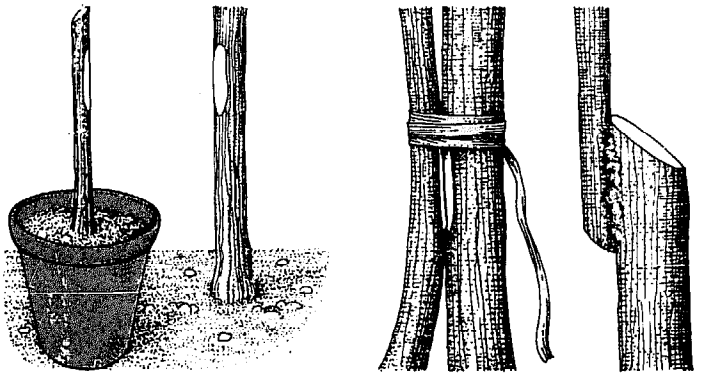
**PROPAGATING FROM CUTTINGS**
*Take a spade and make a long deep nick in sandy soil. Plant the cuttings, leaving the top bud just above soil level. Stamp them in hard. Most of the cuttings will root and by the next spring will be ready to plant out.*



strong enough not to need this protection.

If you wish to change the scion of an unsatisfactory vine you can try approach grafting. This is a very simple method. Plant a cutting of the desired scion in a pot. When it has taken, place the pot near the growing vine and slice off a short piece of bark with a little wood from the stems of both vine and scion. Put the two cut faces together, bind and wax them. When the graft has taken, cut off the scion plant below the graft and the root stock plant above it.

Most European vines are grafted on to American root stocks, because *Vitis vinifera* cultivars, which Europeans prefer, cannot be grown on their own roots; they are attacked by an aphid called *phylloxera*. American root stocks have a high degree of immunity to this insect.



**APPROACH GRAFTING**
*You can improve the quality of a vine by changing the scion. Plant the new scion in a pot near the vine; chop off a little slice of wood from both vine and scion (above left). Put the two cut faces together, bind and wax as usual (above right).*

## Care while growing

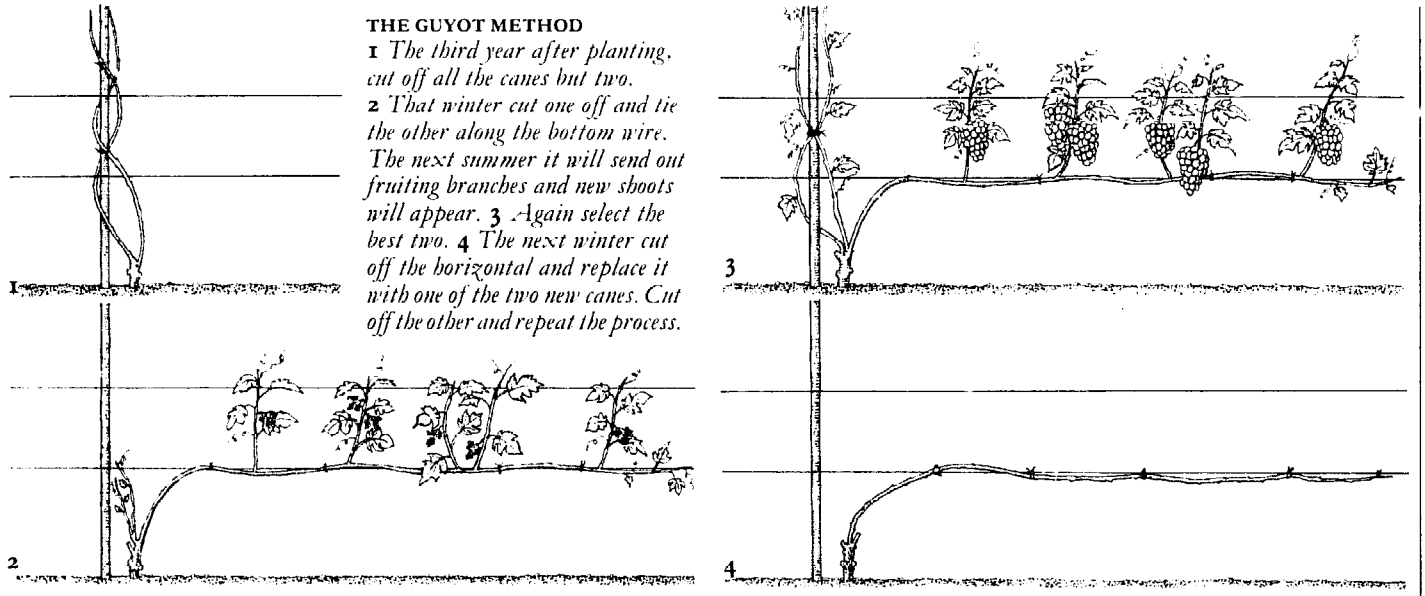
For the first three or four years it is most important to keep the ground beneath and between vines free of weeds. At first you can do this by deep digging or plowing. Then, as the roots spread, shallower cultivation is better, because this will not damage them. A rotary tiller is useful for this job, but shallow scuffling with a hoe will do as well. Heavy green mulching is also effective: comfrey or lucerne (alfalfa) are good for this. Moderate feeding with manure or compost from time to time is beneficial.

***Pruning*** Training and pruning are subjects of labyrinthine complexity and endless argument: only the benign fermented juice of the grape itself serves to prevent such arguments from becoming vitriolic. The best thing to do, I suggest, is to copy your grape-growing neighbors. But as a general rule the colder your climate is the smaller you should keep your vines. In Italy you may find great straggling vines growing up elm trees. In the U.S. the native grapes are often grown that way too, but it is generally advisable to cut them back rather hard.

The thing to remember when pruning vines is that grapes only grow on this year's shoots, sprouting from last year's wood. Old wood will not fruit, nor will new shoots springing from two or three-year-old wood. Therefore there must be just enough of the last year's wood to produce the current year's fruiting spurs. And it is these fruiting spurs which will send out new fruiting spurs next year. You can keep some of the present year's canes free of fruit, by stripping young fruit off them, and use them as the next year's base for new fruiting canes. But this method is expedient only in climates where grapes grow freely.

***Guyot method*** In practice, in cold climates, you will probably need to use the Guyot method, which works as follows. Plant the vines four feet (1.2 m) apart in rows six feet (1.8 m) apart. Erect a two-wire fence along each row with the bottom wire 15 inches (38 cm) from the ground and the top wire a foot (30 cm) higher. Set a light stake four and a half feet (1.3 m) long and tie it to both horizontal wires. In the third winter after planting cut all the canes except two down close to the ground. Tie the two remaining canes to the upright stake and pinch them off when they get a few inches taller than the stake. Do not allow them to fruit, and pinch the laterals off when they are a few inches long.

The following winter cut one of the two vertical canes right off (it was only spare), bend the other one over and tie it along the bottom wire. Come summer it will send out fruiting branches. When they are long enough, tie these to the top wire. Prune any that are not going to bear and snip off the ends of the fruiting branches, leaving four to five leaves above the flowering bunches. Now new shoots will come from the stool (stem) of the plant. Keep two of them and cut off all the others. Cut the tips off when they are taller than the stake, say five feet (1.5 m) high. The next




**THE GUYOT METHOD**
*1 The third year after planting, cut off all the canes but two. 2 That winter cut one off and tie the other along the bottom wire. The next summer it will send out fruiting branches and new shoots will appear. 3 Again select the best two. 4 The next winter cut off the horizontal and replace it with one of the two new canes. Cut off the other and repeat the process.*

winter cut right off the horizontal that bore the fruiting branches, bend down the better of the two vertical canes to take its place, and cut the other cane right off. Next year repeat the process. In this way every summer you always have one horizontal cane bearing fruiting wood, and two of the current year's canes being kept in reserve to fruit the following year.

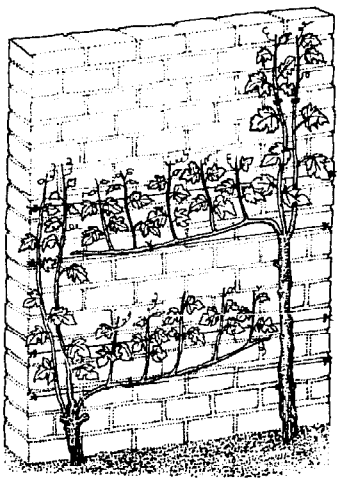
If you are training vines up walls – one of the best ways of growing them – you can practice exactly the same method in a modified but more extensive form (see below).

It is a good idea to grow vines on south-facing walls: they are more decorative than any ornamental creeper and far more useful.

### Pests and diseases

***Powdery mildew or oidium*** This is a very common complaint. A fine dusty film forms over the vine. To prevent it dust with sulfur every three weeks from the flowering stage until the grapes start to ripen.

***Downy mildew*** This causes a much thicker layer of white down than powdery mildew. To prevent it spray with Bordeaux mixture (see p. 104) every three weeks. You will not get the disease under cloches or in greenhouses, because it is spread by droplets of rain.



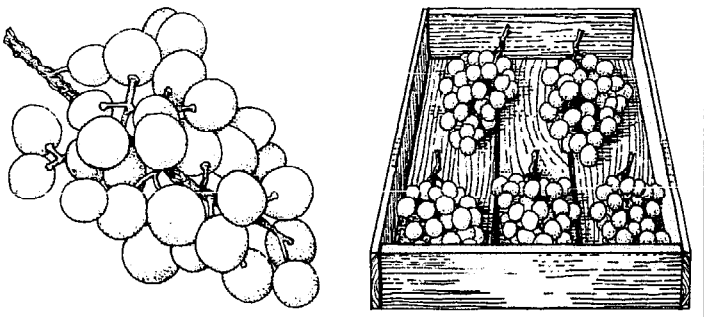
**TRAINING UP WALLS**
*A modification of the Guyot method works well. Instead of cutting the vine right back each year, let it establish a framework of old wood and then allow horizontal branches to develop as if the top of the old wood were at ground level. If the wall is high, plant two vines or more; let the permanent wood grow tall on some and keep it short on others. Vines fruit at their extremities, so if you try to make one vine cover the whole wall, you will only get fruit at the top.*

***Black spot or anthracnose*** This can appear after periods of wet weather. It causes well-defined black spots on the leaves. Routine spraying for downy mildew should prevent it. If it does not, increase the strength of the mixture to one pound (450 g) of copper sulfate, 14 ounces (400 g) of lime, and seven gallons (27 l) of water.

***Vine mite*** This produced blisters on the tops of the leaves. Sulfur dusting for powdery mildew will also control this.

***Birds*** It is quite possible to lose your entire grape crop to the birds. If you suffer from them badly you must enclose your vines with netting.

***Wasps*** Wasps can decimate a crop of grapes. Prepare a bait made of some sweet stuff, include a few squashed grapes and mix some poison in with it. Track down and destroy nests.



**STORING GRAPES**
*Spread out the bunches in single layers as far as possible, and leave them after picking until the stems begin to shrivel (above left). Then store them in trays in a cool place (right).*

### Harvesting

Leave the fruit on the vines until they are fully ripe, because the riper they get, the sweeter they taste and the better wine they make. They are ripe when the stem of the bunch begins to turn brown.

Snip the bunches from the vines with shears. Spread out the bunches in single layers and leave at 50°F (10°C) until the stems begin to shrivel. Then store in shallow trays in a cool, slightly humid cellar or storeroom at 40°F (4°C). Grapes will keep fresh for several months stored in this way. For instructions on making wine see p. 224.

CHAPTER SEVEN

# *The Cultivation of Herbs*

*Containing the sowing, growing and harvesting instructions for the many useful herbs that can be nurtured in the kitchen garden.*